MDS-JB940

SERVICE MANUAL

Ver. 1.2 2005.12

Self Diagnosis Supported model

US Model
Canadian Model
AEP Model
UK Model

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Model Name Using Similar Mechanism	NEW
MD Mechanism Type	MDM-7A
Optical Pick-up Name	KMS-260B/J1N

SPECIFICATIONS

System MiniDisc digital audio system
Disc MiniDisc
Laser Semiconductor laser (λ = 780 nm)
Emission duration: continuous
Laser output MAX 44.6 µW[1)]

1) This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block with 7 mm aperture.

Laser diode Material: GaAlAs
Revolutions (CLV) 400 rpm to 900 rpm
Error correction ACIRC (Advanced Cross Interleave Reed Solomon Code)
Sampling frequency 44.1 kHz
Coding ATRAC (Adaptive TRansform Acoustic Coding)/ATRAC 3
Modulation system EFM (Eight-to-Fourteen Modulation)
Number of channels 2 stereo channels
Frequency response 5 to 20,000 Hz ±0.3 dB
Signal-to-noise ratio Over 100 dB during play
Wow and flutter Below measurable limit

Inputs

ANALOG IN Jack type: phono
Impedance: 47 kilohms
Rated input: 500 mVrms
Minimum input: 125 mVrms

DIGITAL OPTICAL IN1 Connector type: square optical
Impedance: 660 nm (optical wave length)

DIGITAL OPTICAL IN2 Connector type: square optical
Impedance: 660 nm (optical wave length)

DIGITAL COAXIAL IN Jack type: phono
Impedance: 75 ohms
Rated input: 0.5 Vp-p, ±20 %

Outputs

PHONES Jack type: stereo phone
Rated output: 28 mW
Load impedance: 32 ohms

ANALOG OUT Jack type: phono
Rated output: 2 Vrms (at 50 kilohms)
Load impedance: over 10 kilohms

DIGITAL OPTICAL OUT Connector type: square optical
Rated output: –18 dBm
Load impedance: 660 nm (optical wave length)

DIGITAL COAXIAL OUT Jack type: phono
Rated output: 0.5 Vp-p (at 75 ohms)
Load impedance: 75 ohms

General

Power requirements

Where purchased	Power requirements
U.S.A. and Canada	120 V AC, 60 Hz
Europe	230 V AC, 50/60 Hz

Power consumption 18 W
Dimensions (approx.) 430 × 111 × 286 mm (17 × 4 3/8 × 11 3/8 in.) (w/h/d) incl. projecting parts and controls
Mass (approx.) 5.3 kg (11 lbs 11 oz)

Supplied accessories

This MD deck comes with the following items:
Audio connecting cords (2)
Optical cable (1)
Remote commander (remote) (1)
R6 (size-AA) batteries (2)

US and foreign patents licensed from Dolby Laboratories.

Design and specifications are subject to change without notice.

MINIDISC DECK

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Home Audio Division
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SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer: Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.

2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.

3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

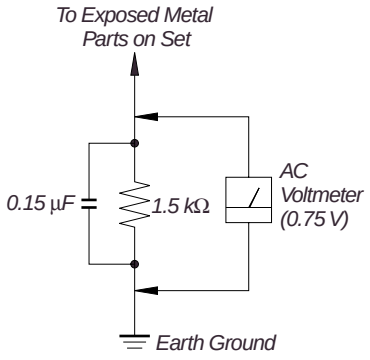
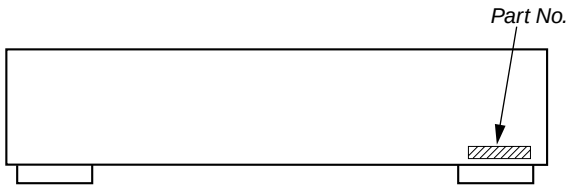


Fig. A. Using an AC voltmeter to check AC leakage.

MODEL IDENTIFICATION

— BACK PANEL —



Model	Part No.
AEP, UK models	4-228-507-0☐
Canadian model	4-228-507-1☐
US model	4-228-507-2☐

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the manufacturer.
Discard used batteries according to the manufacturer's instructions.

ADVARSEL!

Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri
af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

ADVARSEL

Eksplosjonsfare ved feilaktig skifte av batteri.
Benytt samme batteritype eller en tilsvarende type
anbefalt av apparatfabrikanten.
Brukte batterier kasseres i henhold til fabrikantens
instruksjoner.

VARNING

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en likvärdig typ som
rekommenderas av apparattillverkaren.
Kassera använt batteri enligt gällande föreskrifter.

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.
Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic break-down because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.
During repair, pay attention to electrostatic break-down and also use the procedure in the printed matter which is included in the repair parts.
The flexible board is easily damaged and should be handled with care.

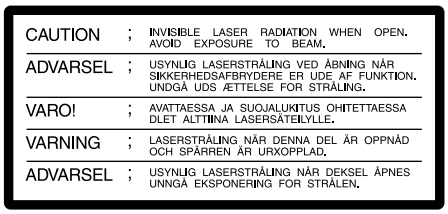
NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe from more than 30 cm away from the objective lens.

Laser component in this product is capable of emitting radiation exceeding the limit for Class 1.

This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.

The following caution label is located inside the unit.


CAUTION ; INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.
ADVARSEL ; USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDS ÆTTELSE FOR STRÅLING.
VARO! ; AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA LASERSÄTEILYLLE.
VARNING ; LASERSTRÅLING NÄR DENNA DEL ÄR OPPNÅD OCH SPÄRREN ÄR URXOPPLAD.
ADVARSEL ; USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES UNNGÅ EKSPONERING FOR STRÅLEN.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Flexible Circuit Board Repairing

- Keep the temperature of soldering iron around 270˚C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈSES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPÉMENTS PUBLIÉS PAR SONY.

SELF-DIAGNOSIS FUNCTION

The self-diagnosis function consists of error codes for customers which are displayed automatically when errors occur, and error codes which show the error history in the test mode during servicing. For details on how to view error codes for the customer, refer to the following box in the instruction manual. For details on how to check error codes during servicing, refer to the following "Procedure for using the Self-Diagnosis Function (Error History Display Mode)".

The deck's self-diagnosis function automatically checks the condition of the MD deck when an error occurs, then issues a three- or five-digit code and an error message on the display. If the code and message alternate, find them in the following table and perform the indicated countermeasure. Should the problem persist, consult your nearest Sony dealer.

Three- or five-digit code/ Message	Cause/Remedy
C11/Protected	The inserted MD is record-protected. Take out the MD and close the record-protect slot (page 15).
C12/Cannot Copy	You tried to record a CD with a format that the external device connected to the deck does not support, such as CD-ROM or video CD. Remove the disc and insert a music CD.
C13/REC Error	The recording was not made properly. Set the deck in a stable surface, and repeat the recording procedure.
	The inserted MD is dirty (with smudges, fingerprints, etc.), scratched, or substandard in quality. Replace the disc and repeat the recording procedure.
C13/Read Error	The deck could not read the TOC on the MD properly. Take out the MD and insert it again.
C14/Toc Error	The deck could not read the TOC on the MD properly. Insert another disc. If possible, erase all the tracks on the MD (page 32).
C41/Cannot Copy	The sound source is a copy of commercially available music software, or you tried to record a CD-R (Recordable CD). The Serial Copy Management System prevents making a digital copy (page 52). You cannot record a CD-R.

Three- or five-digit code/ Message	Cause/Remedy
C71/Din Unlock	The sporadic appearance of this message is caused by the digital signal being recorded. This will not affect the recording.
	While recording from a digital component connected through the DIGITAL IN connector, the digital connecting cable was unplugged or the digital component turned off. Connect the cable or turn the digital component back on.
E0001/ MEMORY NG	There is an error in the internal data that the deck needs in order to operate. Consult your nearest Sony dealer.
E0101/ LASER NG	There is a problem with the optical pickup. The optical pickup may have failed. Consult your nearest Sony dealer.

PROCEDURE FOR USING THE SELF-DIAGNOSIS FUNCTION (ERROR HISTORY DISPLAY MODE)

Note: Perform the self-diagnosis function in the "error history display mode" in the test mode. The following describes the least required procedure. Be careful not to enter other modes by mistake. If you set other modes accidentally, press the MENU/NO button to exit the mode.

1. While pressing the ⏮ AMS ⏭ knob and ■ button, connect the power plug to the outlet, and release the ⏮ AMS ⏭ knob and ■ button. When the test mode is set "[Check]" is displayed.
2. Turn the ⏮ AMS ⏭ knob and when "[Service]" is displayed, press the YES button.
3. Turn the ⏮ AMS ⏭ knob to display "Err Display".
4. Press the YES button to sets the error history mode and displays "op rec tm".
5. Select the contents to be displayed or executed using the ⏮ AMS ⏭ knob.
6. Press the ⏮ AMS ⏭ knob to display or execute the contents selected.
7. Press the ⏮ AMS ⏭ knob another time to return to step 4.
8. Press the MENU/NO button to display "Err Display" and release the error history mode.
9. To release the test mode, press the REPEAT button. The unit sets into the STANDBY state and the test mode ends.

[ITEMS OF ERROR HISTORY MODE ITEMS AND CONTENTS]

Display	Details of History
op rec tm	Displays the total recording time. When the total recording time is one minute or longer, displays the time and minute. When the total recording time is less than one minute, displays “Under 1 min”. The displayed time is about 1/4 of the actual recording time when the laser is set to the high power state.
op play tm	Displays the total playback time. When the total playback time is one minute or longer, displays the time and minute. When the total playback time is less than one minute, displays “Under 1 min”.
spdl rp tm	Displays the total time when the spindle motor rotates. When the total rotation time is one minute or longer, displays the time and minute. When the total rotation time is less than one minute, displays “Under 1 min”.
retry err	Displays the total number of retries during recording and number of retry errors during playback. Displayed as “r xx p yy”. “xx” indicates the number of retries during recording, “yy” indicates the number of retry errors during playback. The numbers are displayed in hexadecimal from 00 to FF.
total err	Displays the total number of errors. Displayed as “total xx”. The number is displayed in hexadecimal from 00 to FF.
err history	Displays the last ten errors. Displayed as “0x ErrCd@@”. “x” indicates the history number. A smaller number indicates a more recent error (00 is the latest). @@ indicates the error code. The error history number is selected by turning the ⏮ AMS ⏭ knob.
retry adrs	Displays the last five retry addresses. Displayed as “xx ADRS yyyy”. “xx” indicates the history number. “yyyy” indicates the cluster where the retry occurred. The history number is selected by turning the ⏮ AMS ⏭ knob.
er refresh	Mode which erases the error history and the retry address history [Operation procedure] ① When “er refresh” is displayed, press the ⏮ AMS ⏭ knob. ② After the display changes to “er refresh?”, press the YES button. The “Complete!” message indicates that the operation has ended. After executing this mode, be sure to check the following: • The data has been erased. • The mechanism runs normally when recording and playback are performed.
op change	Mode which erases the total time of “op rec tm” and “op play tm” These histories are used as a guideline for the time to replace the optical pick-up. After replacing the optical pick-up, perform this operation to erase the history. [Operation procedure] ① When “op change” is displayed, press the ⏮ AMS ⏭ knob. ② After the display changes to “op change?”, press the YES button. The “Complete!” message indicates that the operation has ended.
spdl change	Mode which erases the total time of “spdl rp tm” The history is used as a guideline for the time to replace the spindle motor. After replacing the spindle motor, perform this operation to erase the history. [Operation procedure] ① When “spdl change” is displayed, press the ⏮ AMS ⏭ knob. ② After the display changes to “spdl change?”, press the YES button. The “Complete!” message indicates that the operation has ended.

Table of Error Codes

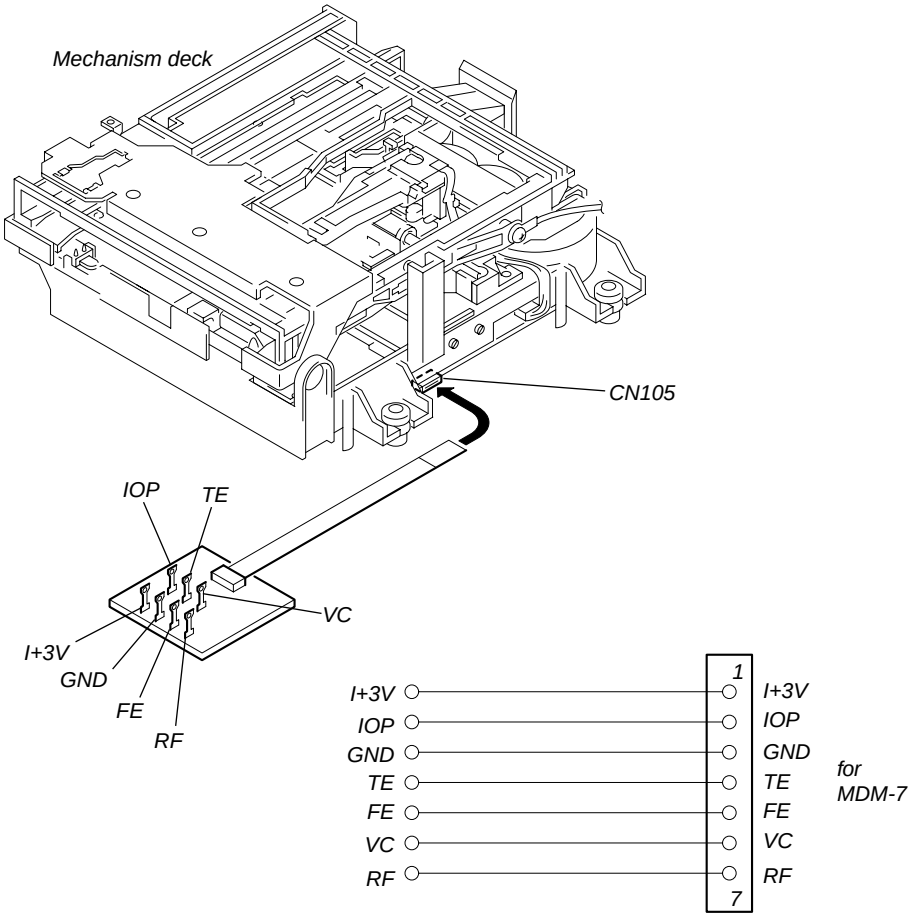
Error Code	Details of Error	Error Code	Details of Error
10	Loading error	31	There is an abnormality in the sector contents.
12	The combination of loading switches is not acceptable.	40	An error caused a retry during continuous recording.
20	Time out. The beginning of PTOC cannot be read.	41	Retry was executed due to DRAM overflow.
21	Contents error. The beginning of PTOC can be read.	42	Retry was executed during TOC writing.
22	Time out. Access to UTOC failed.	43	S.F Edit was aborted due to retry.
23	Time out. UTOC cannot be read.	50	Address cannot be read although access processing is not in progress.
24	Contents error of UTOC		
30	Playback start error	51	Runaway due to focus NG

SECTION 1
SERVICE NOTE

JIG FOR CHECKING BD BOARD WAVEFORM

The special jig (J-2501-196-A) is useful for checking the waveform of the BD board. The names of terminals and the checking items to be performed are shown as follows.

GND : Ground
I+3V : For measuring IOP (Check the deterioration of the optical pick-up laser)
IOP : For measuring IOP (Check the deterioration of the optical pick-up laser)
TEO : TRK error signal (Traverse adjustment)
VC : Reference level for checking the signal
RF : RF signal (Check jitter)
FE : FOCUS error



IOP DATA RECORDING AND DISPLAY WHEN OPTICAL PICK-UP AND NON-VOLATILE MEMORY (IC195 OF BD BOARD) ARE REPLACED

The IOP value labeled on the optical pick-up can be recorded in the non-volatile memory. By recording the value, it will eliminate the need to look at the value on the optical pick-up label. When replacing the optical pick-up or non-volatile memory (IC195 of BD board), record the IOP value on the optical pick-up according to the following procedure.

Record Procedure:

1. While pressing the [⏮ AMS ⏭] knob and [■] button, connect the power plug to the outlet, and release the [⏮ AMS ⏭] knob and [■] button.
2. Turn the [⏮ AMS ⏭] knob to display "[Service]", and press the [YES] button.
3. Turn the [⏮ AMS ⏭] knob to display "lop Write" (C28), and press the [YES] button.
4. The display becomes "Ref=@@@.@" (@ is an arbitrary number) and the numbers which can be changed will blink.
5. Input the IOP value written on the optical pick-up label.
   To select the number : Turn the [⏮ AMS ⏭] knob.
   To select the digit : Press the [⏮ AMS ⏭] knob.
6. When the [YES] button is pressed, the display becomes "Measu=@@@.@" (@ is an arbitrary number).
7. As the adjustment results are recorded for the 6 value. Leave it as it is and press the [YES] button.
8. "Complete!" will be displayed momentarily. The value will be recorded in the non-volatile memory and the display will become "Iop Write".
9. Press the [FILTER] button to complete.

Display Procedure:

1. While pressing the [⏮ AMS ⏭] knob and [■] button, connect the power plug to the outlet, and release the [⏮ AMS ⏭] knob and [■] button.
2. Turn the [⏮ AMS ⏭] knob to display "[Service]", and press the [YES] button.
3. Turn the [⏮ AMS ⏭] knob to display "lop Read" (C27).
4. "@@.@/##.#" is displayed and the recorded contents are displayed.
   @@.@ : indicates the IOP value on the optical pick-up label.
   ##.# : indicates the IOP value after adjustment
5. To end, press the [⏮ AMS ⏭] knob or [MENU/NO] button to display "Iop Read". Then press the [FILTER] button.

CHECKS PRIOR TO PARTS REPLACEMENT AND ADJUSTMENTS

Before performing repairs, perform the following checks to determine the faulty locations up to a certain extent.
Details of the procedures are described in “5. Electrical Adjustments”.

	Criteria for Determination (Unsatisfactory if specified value is not satisfied)	Measure if unsatisfactory:
Laser power check (See page 25)	• 0.9 mW power Specified value : 0.84 to 0.92 mW • 7.0 mW power Specified value : 6.8 to 7.2 mW	• Clean the optical pick-up • Adjust again • Replace the optical pick-up
	Iop (at 7mW) • Labeled on the optical pickup Iop value ± 10mA	• Replace the optical pick-up
Temp check (See page 25)	• Unsatisfactory if displayed as T=@@ (##) [NG” NG (@@, ## are both arbitrary numbers)	• Check for disconnection of the circuits around D101 (BD board) • Check the signals around IC101, IC151, CN102, CN103 (BD board)

Note: The criteria for determination above is intended merely to determine if satisfactory or not, and does not serve as the specified value for adjustments. When performing adjustments, use the specified values for adjustments.

RETRY CAUSE DISPLAY MODE

- In this test mode, the causes for retry of the unit during recording can be displayed on the fluorescent indicator tube. During playback, the "track mode" for obtaining track information will be set.
  This is useful for locating the faulty part of the unit.
- The following will be displayed :
  During recording and stop : Retry cause, number of retries, and number of retry errors.
  During playback : Information such as type of disc played, part played, copyright.
  These are displayed in hexadecimal.

Procedure:

1. Procedure 1: Press the [■] button continuously for about 10 seconds.
   Procedure 2: Press the [LEVEL/DISPLAY/CHAR] button while pressing the [■] button and [MENU/NO] button.
2. When the mode is set, "RTs 00c 00e 000" is displayed.
3. Press the [● REC] button to start recording. Then press the [❚❚] button and start recording.
4. To check the "track mode", press the [▷] button to start play.
5. To exit the test mode, press the [I/⏻] button, and turn OFF the power. When "TOC" disappears, disconnect the power plug from the outlet.

Fig. 1 Reading the Test Mode Display (During recording and stop)

[RTs@@c##e**]
Fluorescent indicator tube display

@@ : Cause of retry
: Number of retries
** : Number of retry errors

Fig. 2 Reading the Test Mode Display (During playback)

[@@ ###** $$]
Fluorescent indicator tube display

@@ : Parts No. (name of area named on TOC)
: Cluster } Address
** : Sector }
$$: Track mode (Track information such as copyright information of each part)

Reading the Retry Cause Display

	Higher Bits				Lower Bits				Hexa-decimal	Cause of Retry	Occurring conditions
Hexadecimal	8	4	2	1	8	4	2	1			
Bit	b7	b6	b5	b4	b3	b2	b1	b0			
Binary	0	0	0	0	0	0	0	1	01	shock	When track jump (shock) is detected
	0	0	0	0	0	0	1	0	02	ader5	When ADER was counted more than five times continuously
	0	0	0	0	0	1	0	0	04	Discontinuous address	When ADIP address is not continuous
	0	0	0	0	1	0	0	0	08	DIN unlock	When DIN unlock is detected
	0	0	0	1	0	0	0	0	10	FCS incorrect	When not in focus
	0	0	1	0	0	0	0	0	20	IVR rec error	When ABCD signal level exceeds the specified range
	0	1	0	0	0	0	0	0	40	CLV unlock	When CLV is unlocked
	1	0	0	0	0	0	0	0	80	Access fault	When access operation is not performed normally

Reading the Display:
Convert the hexadecimal display into binary display. If more than two causes, they will be added.

Example

When 42 is displayed:
Higher bit : 4 = 0100 ⟶ b6
Lower bit : 2 = 0010 ⟶ b1
In this case, the retry cause is combined of "CLV unlock" and "ader5".

When A2 is displayed:
Higher bit : A = 1010 ⟶ b7+b5
Lower bit : 2 = 0010 ⟶ b1
The retry cause in this case is combined of "access fault", "IVR rec error", and "ader5".

Reading the Retry Cause Display

	Higher Bits				Lower Bits				Hexa-decimal	Details	
Hexadecimal	8	4	2	1	8	4	2	1		When 0	When 1
Bit	b7	b6	b5	b4	b3	b2	b1	b0			
Binary	0	0	0	0	0	0	0	1	01	Emphasis OFF	Emphasis ON
	0	0	0	0	0	0	1	0	02	Monaural	Stereo
	0	0	0	0	0	1	0	0	04	This is 2-bit display. Normally 01.	
	0	0	0	0	1	0	0	0	08	01:Normal audio. Others:Invalid	
	0	0	0	1	0	0	0	0	10	Audio (Normal)	Invalid
	0	0	1	0	0	0	0	0	20	Original	Digital copy
	0	1	0	0	0	0	0	0	40	Copyright	No copyright
	1	0	0	0	0	0	0	0	80	Write prohibited	Write allowed

Reading the Display:
Convert the hexadecimal display into binary display. If more than two causes, they will be added.

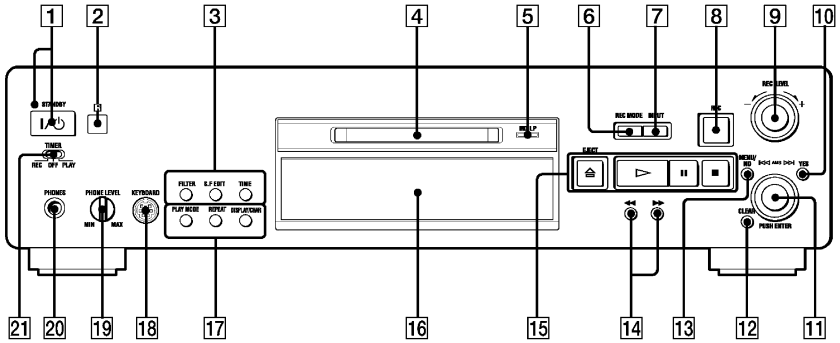
Example When 84 is displayed:
Higher bit : 8 = 1000 ⟶ b7
Lower bit : 4 = 0100 ⟶ b2
In this case, as b2 and b7 are 1 and others are 0, it can be determined that the retry cause is combined of “emphasis OFF”, “monaural”, “original”, “copyright exists”, and “write allowed”.

Example When 07 is displayed:
Higher bit : 0 = 1000 ⟶ All 0
Lower bit : 7 = 0111 ⟶ b0+b1+b2
In this case, as b0, b1, and b2 are 1 and others are 0, it can be determined that the retry cause is combined of “emphasis ON”, “stereo”, “original”, “copyright exists”, and “write prohibited”.

Hexadecimal ⟶ Binary Conversion Table

Hexadecimal	Binary	Hexadecimal	Binary
0	0000	8	1000
1	0001	9	1001
2	0010	A	1010
3	0011	B	1011
4	0100	C	1100
5	0101	D	1101
6	0110	E	1110
7	0111	F	1111

Front panel description



1 I/⏻ (power) switch/STANDBY indicator (14) (23)
Press to turn on the deck. When you turn on the deck, the STANDBY indicator turns off. When you press the switch again, the deck turns off and the indicator lights up.

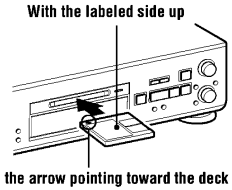
2 Remote sensor (10)
Point the remote toward this sensor (▣) for remote operations.

3 FILTER button (43)
Press to select the type of the digital filter.

S.F EDIT button (37)
Press to change the recorded level after recording.

TIME button (18) (21)
Press to display the remaining time.

4 MD insertion slot (14) (23)
Insert an MD as illustrated below.



5 MD LP indicator (16) (23)
Lights when the deck is playing or recording to an MD in LP2 or LP4 Stereo mode.

6 REC MODE button (16)
Press to set the REC MODE to stereo, LP2, LP4 or MONO.

7 INPUT button (14)
Press to select the input jack (or connector) of the program source to be recorded.

8 REC ● button (14) (18) (19)
Press to record to the MD, monitor the input signal, or mark track numbers.

9 REC LEVEL control (17)
Turn to adjust the recording level.

10 YES button (18) (27) (30) (39) (46)
Press to carry out the selected operation.

11 AMS control (12) (14) (23) (30) (39) (46)
Turn to locate tracks, set the clock, select the input characters, or select a menu item and a setting value.

12 CLEAR button (27) (35)
Press to cancel the selection.

13 MENU/NO button (19) (27) (30) (39) (46) (56)
Press to display the Edit Menu or Setup Menu.

14 ◀◀/▶▶ buttons (25) (27) (30) (35)
Press to locate a portion within a track, change the contents of a program, or change the input character.

15 EJECT ⏏ button (15) (23)
Press to eject the MD.

▷ button (14) (23)
Press to start play.

II button (14) (23)
Press to pause play or recording. Press again to resume play or recording.

■ button (15) (23)
Press to stop play or recording, or cancel the selected operation.

16 Display window (8)
Shows various information.

17 PLAY MODE button (27) (42)
Press to select Shuffle Play or Program Play or resume normal play.

REPEAT button (26)
Press to play tracks repeatedly.

DISPLAY/CHAR button (9) (15) (17) (24) (27) (35)

Press while the deck is	To
Recording or recording pause	Adjust the recording level
Stopped	Display disc information or the contents of a program
Recording	Display information on the track being recorded
Playing	Display information on the current track
Editing	Select the type of characters to be input

18 KEYBOARD jack (46)
Connect a keyboard to this jack to operate the deck using the keyboard.

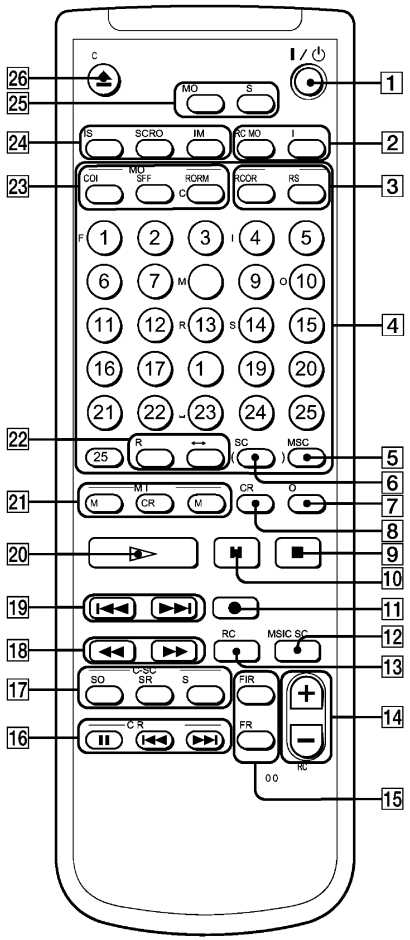
19 PHONE LEVEL control (23)
Turn to adjust the volume of the headphones.

20 PHONES jack (23)
Connect headphones to this jack.

21 TIMER selector (42)
Use to set the timer for recording (REC) or playing (PLAY). Set to OFF to turn off the timer.

This section is extracted from instruction manual.

Remote control description



1 **I/⏻ (power) switch (14) (23)**
Press to turn on the deck. When you turn on the deck, the STANDBY indicator on the deck turns off. When you press the switch again, the deck turns off and the indicator lights up.

2 **REC MODE button (16)**
Press to set the REC MODE to stereo, LP2, LP4 or MONO.

INPUT button (14)
Press to select the input jack (or connector) of the program source to be recorded.

3 **DATE RECORDED button (13)**
Press to display the recording date and time.

DATE PRESENT button (13)
Press to display the current date and time.

4 **Letter/number buttons (24) (35)**
Press to input letters or numbers or select a track.

5 **M.SCAN button (24)**
Press to scan a track within a range of 6 to 20 seconds.

6 **A.SPACE button (29)**
Press to insert a three-second blank space between tracks or to pause play after each track.

7 **P.HOLD button (17)**
Press to turn on and off the Peak Hold Function.

8 **CLEAR button (27) (35)**
Press to cancel the selection.

9 **■ button (15) (23)**
Press to stop play or recording, or cancel the selected operation.

10 **II button (14) (23)**
Press to pause play or recording. Press again to resume play or recording.

11 **● button (14) (18) (19)**
Press to record to the MD, monitor the input signal, or mark track numbers.

12 **MUSIC SYNC button (21)**
Press to start Music Synchro-recording.

13 **T.REC button (20)**
Press to start Time Machine Recording.

14 **REC LEVEL/ANALOG OUT LEVEL +/– buttons (17) (23)**
Press to adjust the recording or analog output level.

15 **FILTER button (43)**
Press to select the type of the digital filter.

FADER button (40)
Press to perform Fade-in Play/Recording or Fade-out Play/Recording.

16 **CD PLAYER II button (21)**
Press to pause the CD play. Press again to resume CD play.

CD PLAYER I◄◄/►►I buttons (21)
Press to locate tracks on the CD.

17 **CD-SYNC STOP button (21)**
Press to stop CD Synchro-recording.

CD-SYNC START button (21)
Press to start CD Synchro-recording.

CD-SYNC STANDBY button (21)
Press to enter standby for CD Synchro-recording.

18 **◄◄/►► buttons (25) (27) (30) (35)**
Press to locate a portion within a track, change the contents of a program, or shift the cursor to the right.

19 **I◄◄/►►I buttons (14) (23) (31) (39) (46)**
Press to locate tracks, or select a menu item and a setting value.

20 **▻ button (14) (23)**
Press to start play.

21 **NAME-IN buttons**

NAME button (35)
Press to add the name or change the name of a track or an MD.

CHAR button (35)
Press to select the type of characters to be input.

NUM button (35)
Press to input numbers.

22 **REPEAT button (26)**
Press to play tracks repeatedly.

A↔B button (26)
Press to select Repeat A-B Play.

23 **PLAY MODE buttons**

CONTINUE button (27)
Press to select normal play.

SHUFFLE button (27)
Press to select Shuffle Play.

PROGRAM button (27)
Press to select Program Play.

24 **DISPLAY button (9) (15) (17) (24) (27)**
Press to select the information to be displayed in the window.

SCROLL button (24)
Press to scroll the name of a track or an MD.

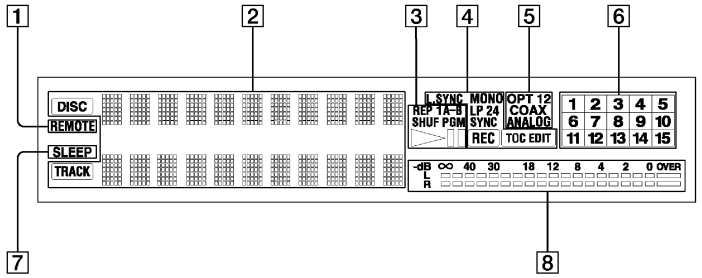
TIME button (18) (21)
Press to display the remaining time.

25 **MENU/NO button (19) (27) (30) (39) (46) (56)**
Press to display the Edit Menu or Setup Menu.

YES button (18) (27) (30) (39) (46)
Press to carry out the selected operation.

26 **EJECT ⏏ button (15) (23)**
Press to eject the MD.

Display window description



1 REMOTE indicator
Lights when the MD is being controlled by an external device connected to the deck.

2 Disc name and track name indicators display

DISC indicator
Lights when the disc information (etc.) is shown.

Name display
Displays disc and track names, Edit Menu parameters, and Setup Menu parameters (etc.).
The track name appears instead of the disc name during play. When the MD or the track has no name, "No Name" appears.

TRACK indicator
Lights when the track information (etc.) is shown.

3 Playback indicators

REP indicators (26)
Light when the deck is set to Repeat Play.
- "REP" lights when the deck is set to repeat the entire disc.
- "REP 1" lights when the deck is set to repeat just one track.
- "REP A-B" lights when the deck is set to repeat a specific portion within a track.

SHUF indicator (27)
Lights when the deck is set to Shuffle Play.

PGM indicator (27)
Lights when the deck is set to Program Play.

▷II indicator
Lights during playing or playing pause.

4 Recording and editing indicators

L.SYNC indicator (19)
Lights when the deck is set to assign track numbers automatically during analog recording.

Rec mode indicators (16)
These indicators turn off during stereo recording/playback.
- "MONO" lights when the deck is set to Monaural Recording mode or playing an MD recorded in Monaural Recording mode.
- "LP2" lights when the deck is set to LP2 Stereo Recording mode or playing an MD recorded in LP2 Stereo Recording mode.
- "LP4" lights when the deck is set to LP4 Stereo Recording mode or playing an MD recorded in LP4 Stereo Recording mode.

SYNC indicator (21)
Lights during synchro-recording.

REC indicator
Lights during recording.

TOC indicators (16) (31)
- "TOC" lights to indicate the presence of TOC data that has not been written to the disc. "TOC" flashes when the TOC data is being written.
- "TOC EDIT" lights during edit operations.

5 INPUT indicators (14)
- "OPT1" lights when the program source is connected to the DIGITAL OPTICAL IN1 connector.
- "OPT2" lights when the program source is connected to the DIGITAL OPTICAL IN2 connector.
- "COAX" lights when the program source is connected to the DIGITAL COAXIAL IN jack.
- "ANALOG" lights when the program source is connected to the ANALOG IN jacks.

6 Music calender
Shows all the track numbers within a grid if the MD is a premastered disc, or without a grid if the MD is a recordable disc. If the total number of tracks exceeds 15, ▶ appears to the right of number 15 in the music calendar.

7 SLEEP indicator (41)
Lights when the deck is set to turn off automatically after specified minutes.

8 Level meters
Display the audio signal levels during playing and recording.

Note
The display format that you have selected in each of the deck statuses (play, recording, etc.) will appear whenever the deck enters that status and you press DISPLAY/CHAR (or DISPLAY) or TIME until you change the format to another (see the following sections for details). If you disconnect the AC power cord, however, all the displays will revert to their default (i.e., the factory set display) the next time you turn on the deck.

To change the display in stop mode

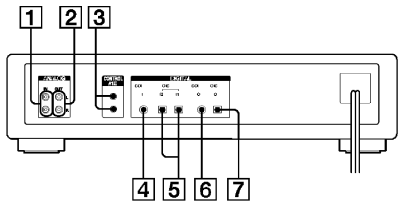
Press DISPLAY/CHAR (or DISPLAY) repeatedly to change the display.

Each press of the button changes the display as follows:

Total number of tracks, total recorded time and disc name[1)]
↓
The contents of a program (only when "PGM" lights up)
↓
Level of the input signal (setting value of the recording level)
↓
Pitch display
↓
DF (digital filter) display
→ (back to the top)

1) "No Name" appears when the disc has no name.

Rear panel description



1 ANALOG IN jacks (11) (14)
Use to input analog signals from other components.

2 ANALOG OUT jacks (11)
Use to output analog signals to other components.

3 CONTROL A1II jacks (11) (44)

4 DIGITAL COAXIAL IN jack (11) (14)
Connect a digital coaxial cable to input digital signals from other components.

5 DIGITAL OPTICAL IN connectors (11) (14)
Connect a digital optical cable to input digital signals from other components. There is no distinction of IN1 and IN2 connectors.

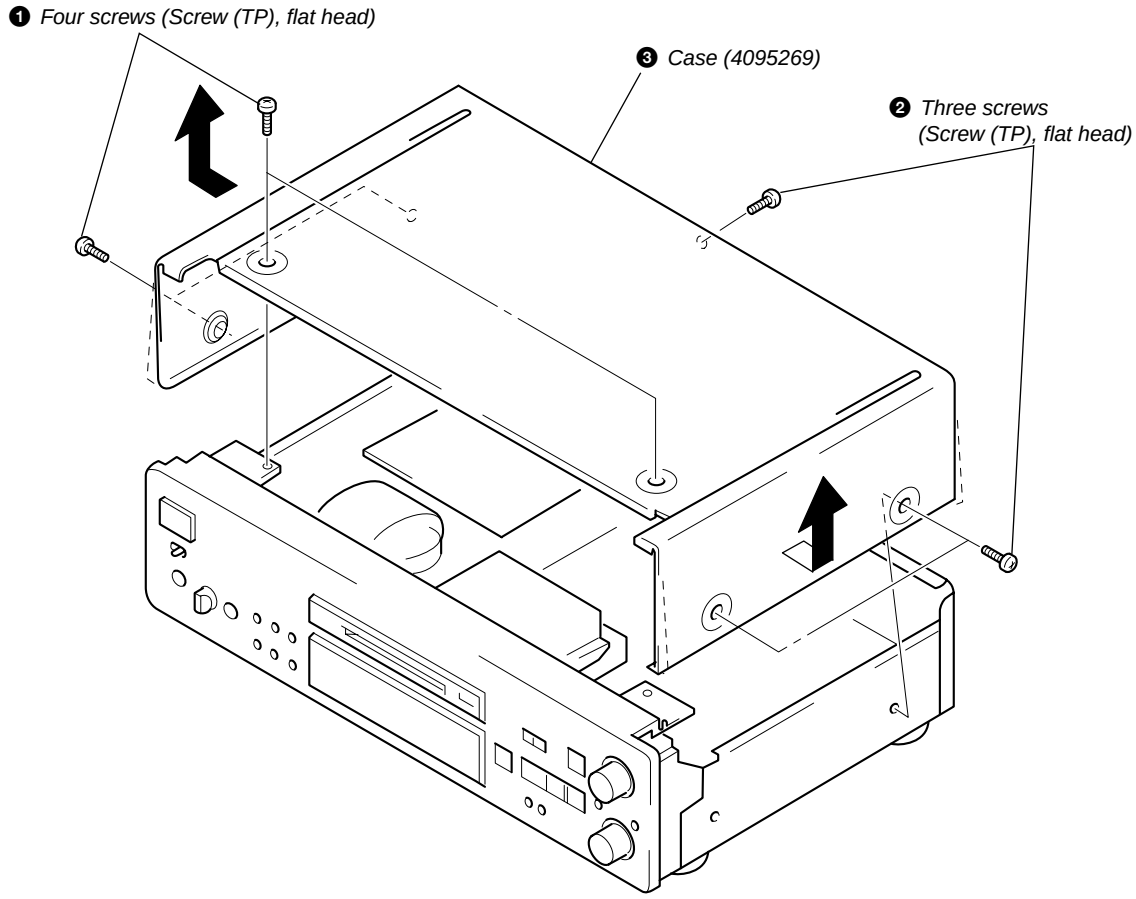
6 DIGITAL COAXIAL OUT jack (11)
Connect a digital coaxial cable to output digital signals to other components.

7 DIGITAL OPTICAL OUT connector (11)
Connect a digital optical cable to output digital signals to other components.

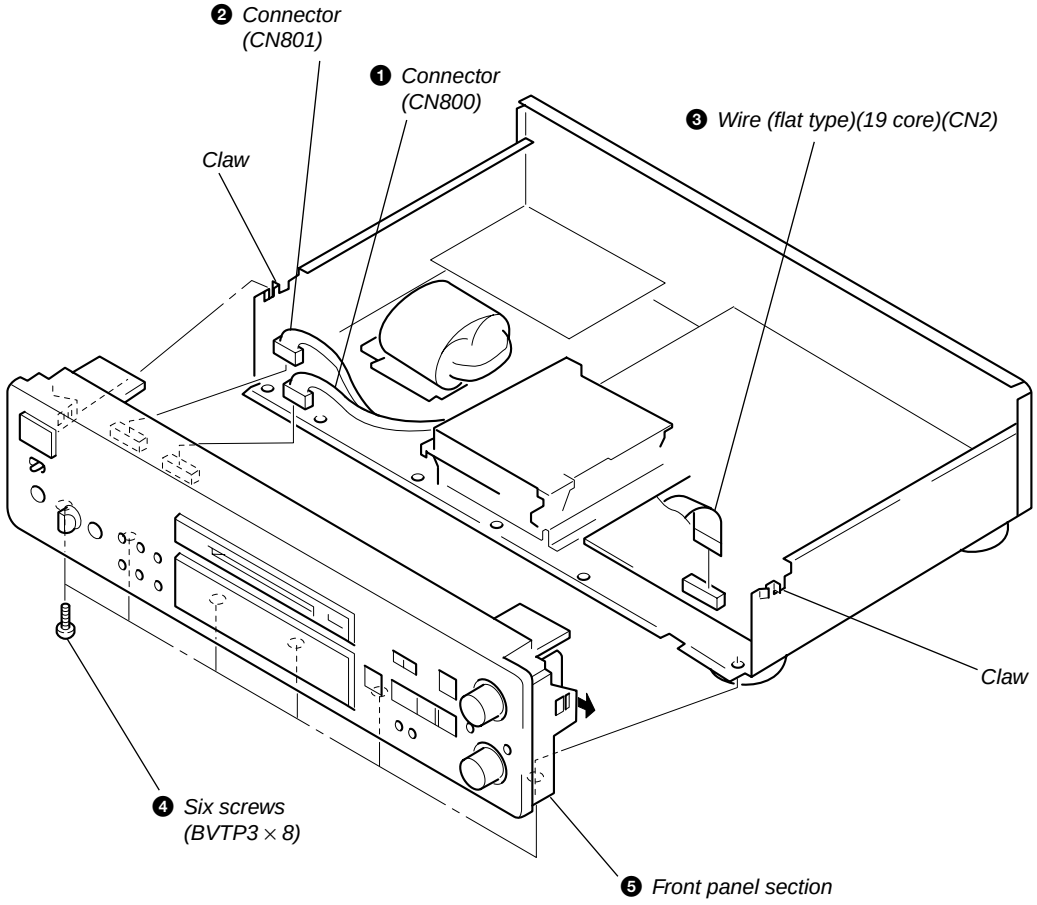
SECTION 3
DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

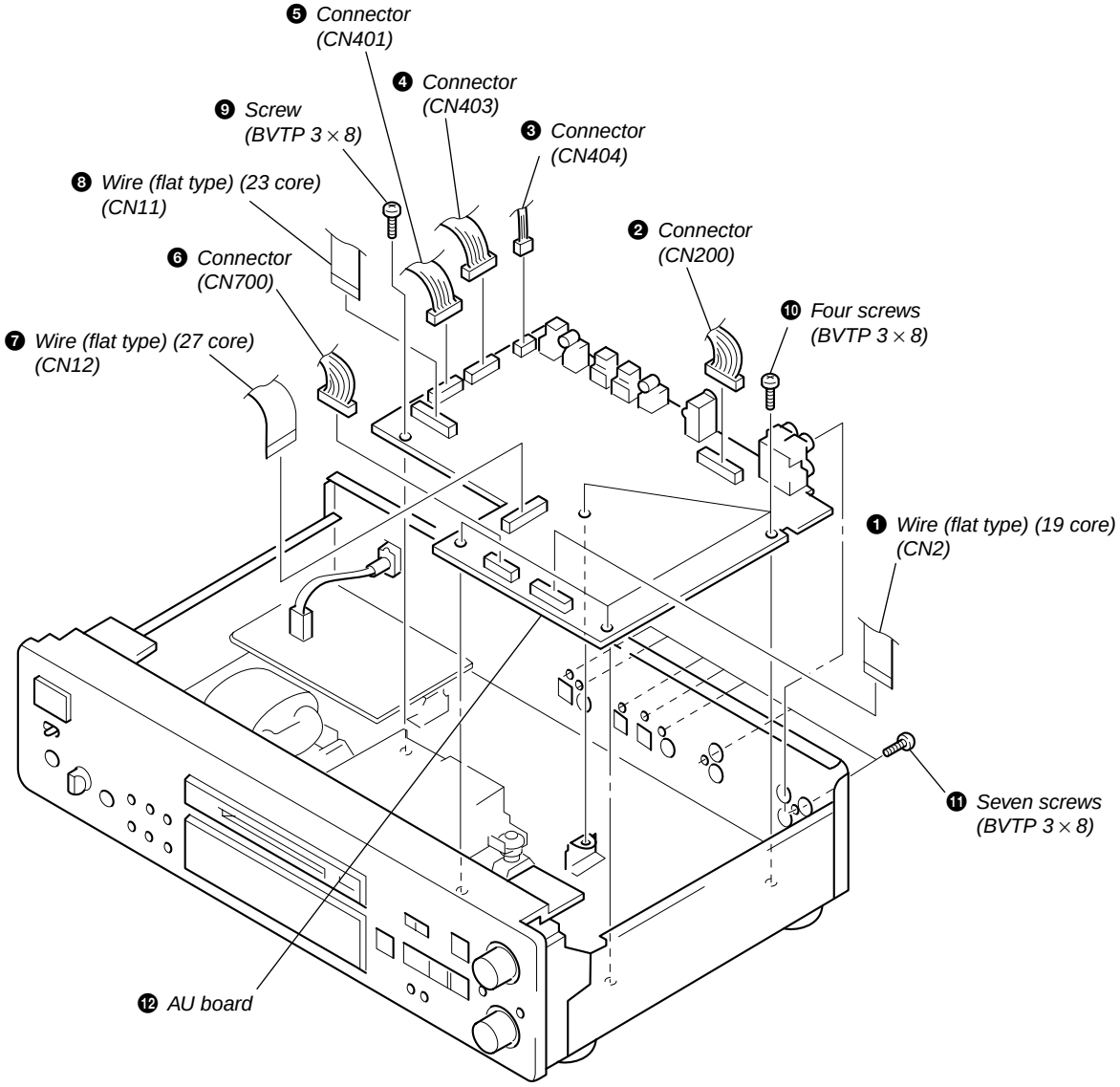
3-1. CASE (4095269)



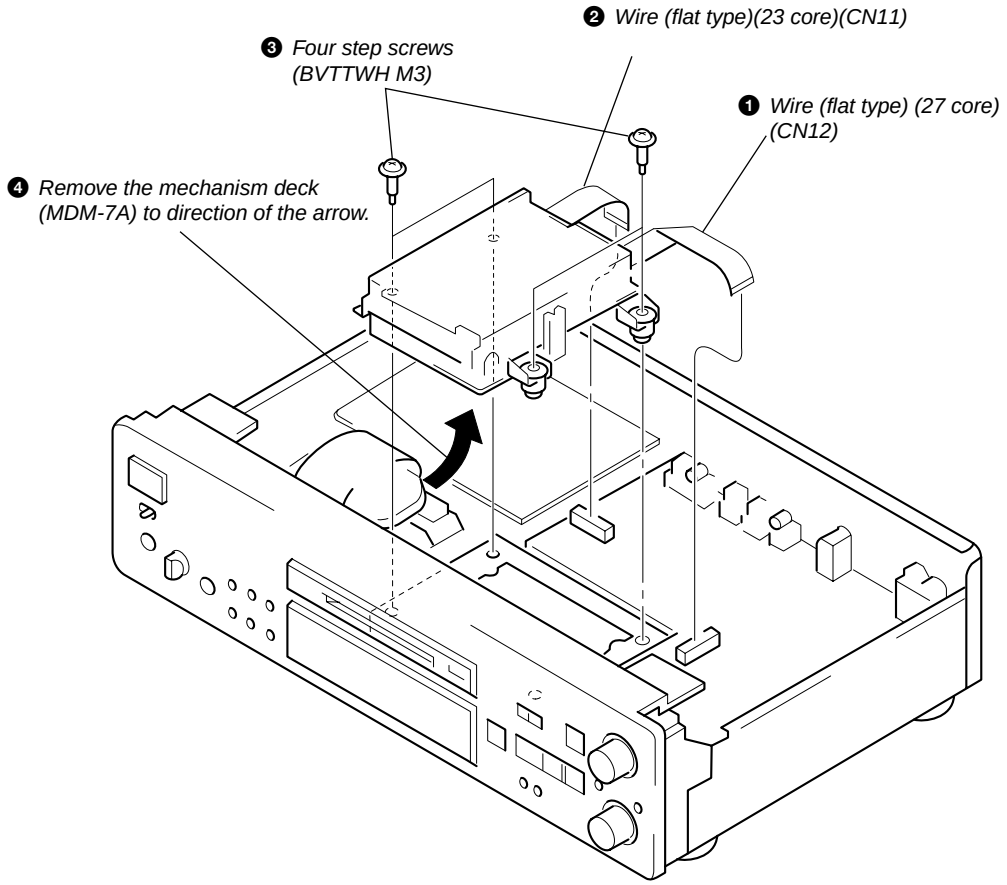
3-2. FRONT PANEL SECTION



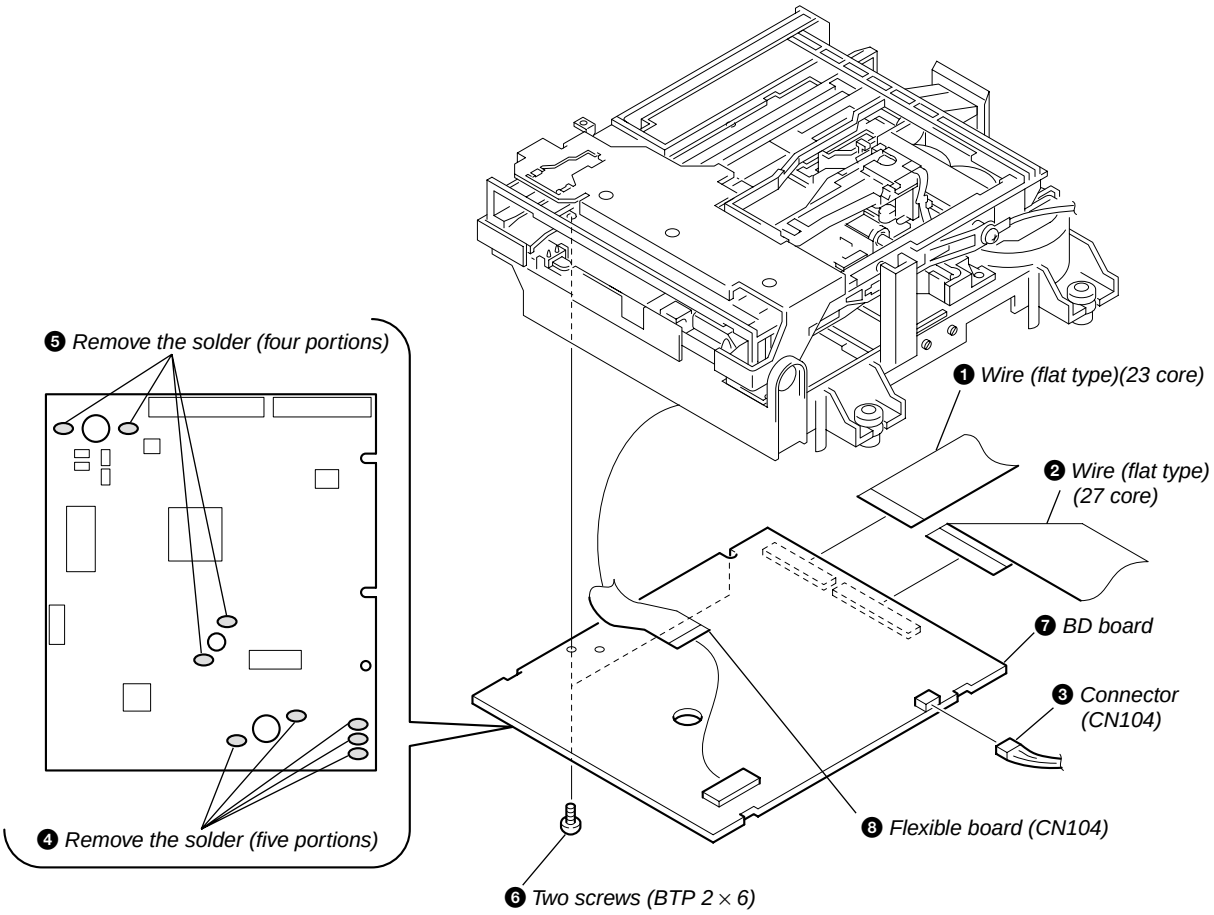
3-3. AU BOARD


❺ Connector (CN401)
❹ Connector (CN403)
❾ Screw (BVTP 3 × 8)
❸ Connector (CN404)
❽ Wire (flat type) (23 core) (CN11)
❷ Connector (CN200)
❻ Connector (CN700)
❿ Four screws (BVTP 3 × 8)
❼ Wire (flat type) (27 core) (CN12)
❶ Wire (flat type) (19 core) (CN2)
⓫ Seven screws (BVTP 3 × 8)
⓬ AU board

3-4. MECHANISM DECK (MDM-7A)


❷ Wire (flat type)(23 core)(CN11)
❸ Four step screws (BVTTWH M3)
❶ Wire (flat type) (27 core) (CN12)
❹ Remove the mechanism deck (MDM-7A) to direction of the arrow.

3-5. BD BOARD


❺ Remove the solder (four portions)
❶ Wire (flat type)(23 core)
❷ Wire (flat type) (27 core)
❼ BD board
❸ Connector (CN104)
❽ Flexible board (CN104)
❹ Remove the solder (five portions)
❻ Two screws (BTP 2 × 6)

SECTION 4
TEST MODE

4-1. PRECAUTIONS FOR USE OF TEST MODE

- As loading related operations will be performed regardless of the test mode operations being performed, be sure to check that the disc is stopped before setting and removing it.
  Even if the [EJECT ⏏] button is pressed while the disc is rotating during continuous playback, continuous recording, etc., the disc will not stop rotating.
  Therefore, it will be ejected while rotating.
  Be sure to press the [EJECT ⏏] button after pressing the [MENU/NO] button and the rotation of disc is stopped.

4-1-1. Recording laser emission mode

- Continuous recording mode (CREC 1 MODE)
- Laser power check mode (LDPWR CHECK)
- Laser power adjustment mode (LDPWR ADJUS)
- IOP check (Iop compare)
- IOP value non-volatile writing (Iop NV Save)
- Traverse (MO) check (EF MO CHECK)
- Traverse (MO) adjustment (EF MO ADJUS)
- When pressing the [REC ●] button.

4-2. SETTING THE TEST MODE

The following are two methods of entering the test mode.

Procedure 1: While pressing the [⏮ AMS ⏭] knob and [■] button, connect the power plug to an outlet, and release the [⏮ AMS ⏭] knob and [■] button.
When the test mode is set, "[Check]" will be displayed. Turn the [⏮ AMS ⏭] knob switches between the following three groups; ⋯ ⟷ [Check] ⟷ [Service] ⟷ [Develop] ⟷ ⋯.

Procedure 2: While pressing the [⏮ AMS ⏭] knob, connect the power plug to the outlet and release the [⏮ AMS ⏭] knob.
When the test mode is set, "TEMP CHECK" will be displayed. By setting the test mode using this method, only the "Check" group of method 1 can be executed.

4-3. RELEASING THE TEST MODE

Press the [REPEAT] button. The test mode is released and the unit sets into the STANDBY state.

4-4. BASIC OPERATIONS OF THE TEST MODE

All operations are performed using the [⏮ AMS ⏭] knob, [YES] button, and [MENU/NO] button.
The functions of these buttons are as follows.

Function name	Function
[MENU/NO] button	Cancels or moves to the next level up in the hierarchy.
[YES] button	Establishes.
[⏮ AMS ⏭] knob (right and left)	Selects.
[⏮ AMS ⏭] knob (push)	Establishes the sub menu.

4-5. SELECTING THE TEST MODE

There are 25 types of test mode as shown below. The groups can be switched by turning the [⏮◁ AMS ▷⏭] knob.
All of the service adjustments and checks can be performed in the test modes of Service group.
There is also the Develop group, but it is not used for service. If the Develop group is set by mistake, immediately press the [MENU/NO] button to release the group.

Display	No.	Contents	Mark	Group	
				Check	Service
AUTO CHECK	C01	Auto self-diagnosis			○
Err Display	C02	Error history display/delete			○
TEMP ADJUS	C03	Temperature compensation offset adjustment			○
LDPWR ADJUS	C04	Laser power adjustment			○
Iop Write	C05	IOP data writing			○
Iop NV Save	C06	The current IOP value is read by the microprocessor and written into non-volatile memory.			○
EF MO ADJUS	C07	Traverse (MO) check			○
EF CD ADJUS	C08	Traverse (CD) check			○
FBIAS ADJUS	C09	Focus bias adjustment			○
AG Set (MO)	C10	Focus tracking gain adjustment (MO)			○
AG Set (CD)	C11	Focus tracking gain adjustment (CD)			○
TEMP CHECK	C12	Temperature compensation offset check		○	○
LDPWR CHECK	C13	Laser power check		○	○
EF MO CHECK	C14	Traverse (MO) check		○	○
EF CD CHECK	C15	Traverse (CD) check		○	○
FBIAS CHECK	C16	Focus bias check		○	○
ScurveCHECK	C17	S-curve check	×	○	
VERIFYMODE	C18	Non-volatile memory check	×	○	
DETRK CHECK	C19	Detrack check	×	○	
0920 CHECK	C25	Outermost circumference check	×	○	
Iop Read	C26	IOP data display		○	○
Iop Compare	C27	Comparison with initial IOP value written in non-volatile memory		○	○
ADJ CLEAR	C28	Initialization of adjustment value in non-volatile memory			○
INFORMATION	C31	Display of version of microprocessor, etc.		○	○
CPLAY 1 MODE	C34	Continuous playback mode		○	○
CREC 1 MODE	C35	Continuous recording mode		○	○

- For details of each adjustment mode, refer to “5. Electrical Adjustments” on page 22.
- For details of “Err Display” (C02), refer to “Self-Diagnosis Function” on page 4.
- If a different mode has been selected by mistake, press the [MENU/NO] button to release that mode.
- Modes with (×) in the Mark column are not used for servicing and therefore are not described in detail. If these modes are set accidentally, press the [MENU/NO] button to release the mode immediately. Be especially careful not to use a test mode of Develop the unit will not operate normally.

4-5-1. Operating the Continuous Playback Mode

1. Entering the continuous playback mode

1) Set the disc in the unit. (Whichever recordable discs or discs for playback only are available.)
2) Turn the [⏮ AMS ⏭] knob and display "CPLAY 1 MODE" (C35).
3) Press the [YES] button to change the display to "CPLAY 1 MID".
4) When access completes, the display changes to "C = ▯▯▯▯ AD = ▯▯".
   Note: The numbers "▯" displayed show you error rates and "ADER".

2. Changing the parts to be played back

1) Press the YES button during continuous playback to change the display as below. The parts to be played back can be moved.

"CPLAY 1 MID" → "CPLAY 1 OUT" → "CPLAY 1 IN" ↩

2) When access completes, the display changes to "C = ▯▯▯▯ AD = ▯▯".
   Note: The numbers "▯" displayed show you error rates and "ADER".

3. Ending the continuous playback mode

1) Press the [MENU/NO] button. The display will change to "CPLAY 1 MODE".
2) Press the [EJECT ⏏] button and take out the disc.
   Note: The playback start addresses for IN, MID, and OUT are as follows.

IN	40h cluster
MID	300h cluster
OUT	700h cluster

4-5-2. Operating the Continuous Recording Mode (Use only when performing self-recording/palyback check.)

1. Entering the continuous recording mode

1) Set a recordable disc in the unit.
2) Turn the [⏮ AMS ⏭] knob and display "CREC 1 MODE" (C34).
3) Press the [YES] button to change the display to "CREC 1 MID".
4) When access completes, the display changes to "CREC 1 (▯▯▯▯" and " **REC** " lights up.
   Note: The numbers "▯" displayed shows you the recording position addresses.

2. Changing the parts to be recorded

1) When the [YES] button is pressed during continuous recording, the display changes as below. The parts to be recorded can be changed.
   " **REC** " goes off during movement.

"CPLAY 1 MID" → "CPLAY 1 OUT" → "CREC 1 IN" ↩

2) When access completes, the display changes to "CREC 1 (▯▯▯▯" and " **REC** " lights up.
   Note: The numbers "▯" displayed shows you the recording position addresses.

3. Ending the continuous recording mode

1) Press the [MENU/NO] button. The display changes to "CREC 1 MODE" and " **REC** " goes off.
2) Press the [⏮ AMS ⏭] button and take out the disc.
   Note 1: The recording start addresses for IN, MID, and OUT are as follows.

IN	40h cluster
MID	300h cluster
OUT	700h cluster

   Note 2: The [MENU/NO] button can be used to stop recording anytime.
   Note 3: Do not perform continuous recording for long periods of time above 5 minutes.
   Note 4: During continuous recording, be careful not to apply vibration.

4-6. FUNCTIONS OF OTHER BUTTONS

Function	Contents
PLAY	Sets continuous playback when pressed in the STOP state. When pressed during continuous playback, the tracking servo turns ON/OFF.
STOP	Stops continuous playback and continuous recording.
FF	The sled moves to the outer circumference only when this is pressed.
FR	The sled moves to the inner circumference only when this is pressed.
REC MODE (other models/SF EDIT/SCROLL)	Switches between the pit and groove modes when pressed.
PLAY MODE	Switches the spindle servo mode (CLV-S ⟷ CLV-A).
DISPLAY	Switches the displayed contents each time the button is pressed
EJECT	Ejects the disc
POWER/REPEAT	Releases the test mode

4-7. TEST MODE DISPLAYS

The DISPLAY/CHAR button is used to change the display mode. Each time the DISPLAY/CHAR button is pressed, the display changes in the following order.

Order	Details	Display
1	Mode display	CPLAY (xxxx
2	Error rate display	C=xxxxAD=xx
3	Address display	hxxxx sxxxx
4	Auto gain display	AG=xx/xx[xx]
5	Detrack display	ADR=xx#0000
6	IVR display	[xx][xx][xx]
7	Display of C1 error and jitter	Jxxxx Cxxxx
8	Display of AD error and jitter	Jxxxx AD=xx

When C-PLAY or C-REC starts, the display is forcibly switched to one of “2” as the initial mode.

Supplementary explanations of each display

1. Mode display
   A display such as “TEMP ADJUST” or “CPLAY 1 MODE” appears.
2. Error rate display
   The error rate is displayed as shown below.
   C=xxxxAD=xx
   C= indicates C1 error, AD= indicates ADER.
3. Address display
   The address is displayed as shown below.
   h=xxxx s=xxxx (pit of recordable disc and playback-only disc)
   h=xxxx a=xxxx (groove of recordable disc)
   h= indicates header address, s= indicates SUBQ address, a= indicates ADIP address.
   * If the address cannot be read, “-” appears.

Displays other than the above are not used for service.

4-8. MEANINGS OF OTHER DISPLAYS

Display	Contents	
	When Lit	When Off
►	Servo ON	Servo OFF
❚❚	Tracking servo OFF	Tracking servo ON
REC	Recording mode ON	Recording mode OFF
SYNC (other models/TOC EDIT)	CLV low speed mode	CLV normal mode
L. SYNC (other models/A.SPACE)	ABCD adjustment completed	
OVER	Tracking offset cancel ON	Tracking offset cancel OFF
B/1 (REP portion)	Tracking auto gain OK	
A-REP	Focus auto gain OK	
TRACK/(LP)4/calender frame	Pit	Groove
DISC/LP2	High reflection	Low reflection
SLEEP/SHUF	CLV-S	CLV-A
MONO	CLV LOCK	CLV UNLOCK

4-9. AUTO DIAGNOSIS FUNCTION

This test mode automatically performs C-REC and C-PLAY and checks mainly the characteristics of the optical pick-up. To execute the test mode, first check the laser power and perform AUTO CHECK after Iop Compare.

[Operation Procedure]

1. Press the YES button. If "LDPWR ﾐﾁｪｯｸ" appears, which means the laser power has not been checked, first check the laser power and perform Iop Compare. Then, repeat this step.
2. If there is a disc in the mechanism deck, the disc is forcibly ejected.
   After "DISC IN" appears, load a recordable test disc (MDW-74/GA-1).
3. When the disc is loaded in step 2, the check automatically starts.
4. While "XX CHECK" is displayed, the check of the item shown in "XX" is in progress.
   After "06 check" is complete, eject the disc loaded in step 2. When "DISC IN" appears, load the TDYS-1 check disc (MD).
5. After the disc loaded in step 4 is loaded, the check automatically restarts from "07 CHECK".
6. After the check of item 12 is complete, "OK" or "NG" appears. When all items are OK, "CHECK ALL OK" appears. If even one of the items failed, "NG: xxxx" appears.

When "CHECK ALL OK" appears, there is no problem in the optical pick-up. Check the operations of the spindle motor, sled motor, etc. If "NG: xxxx" appears, there is an abnormality in the optical pick-up. Replace the optical pick-up.

4-10. INFORMATION

The version of the software is displayed.

[Operation Procedure]

1. When "INFORMATION" appears, press the YES button.
2. The version of the software is displayed.
3. Press the MENU/NO button to end this mode.

4-11. MEASURE WHEN "MEMORY NG" APPEARS

If there is an abnormality in the data of the non-volatile memory, "E001" or "MEMORY NG" appears so that the MD mechanism deck does not continue to be operated. If either of these messages appears, immediately enter the test mode and perform the following operation.

[Operation Procedure]

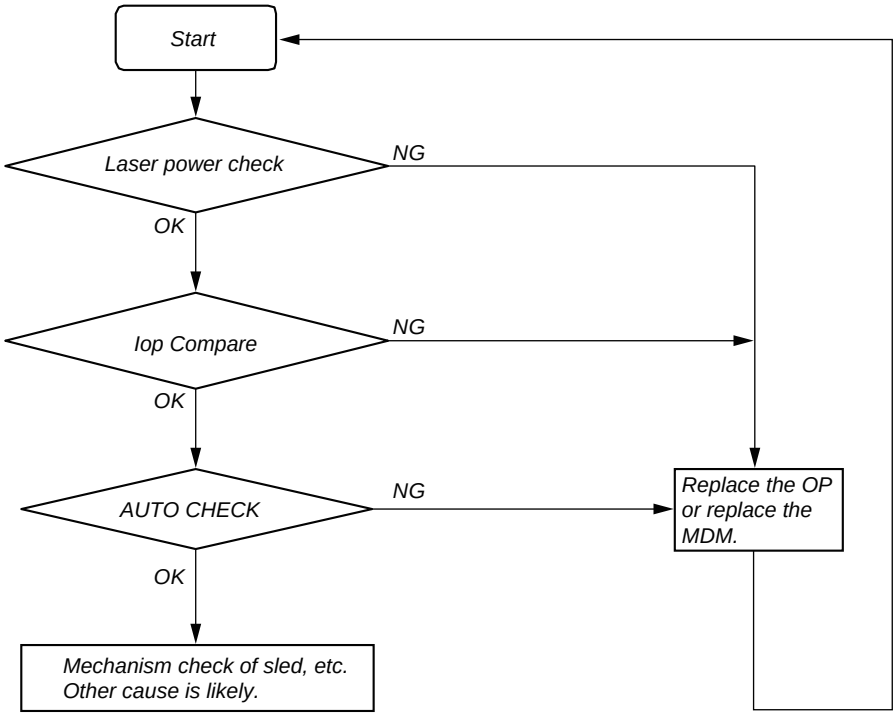
1. Enter the test mode. (Refer to Section 4-2.)
2. Normally, the test mode selection display appears. If there is an abnormality in the non-volatile memory, the message "INIT EEP?" appears.
3. Press the ■ button and the EJECT ⏏ button at the same time.
4. Turn the ⏮ AMS ⏭ knob to select "MDM-7A".
5. Press the ⏮ AMS ⏭ knob. After the non-volatile memory is rewritten, the mode returns to the normal test mode and the test mode selection display appears.

SECTION 5
ELECTRICAL ADJUSTMENTS

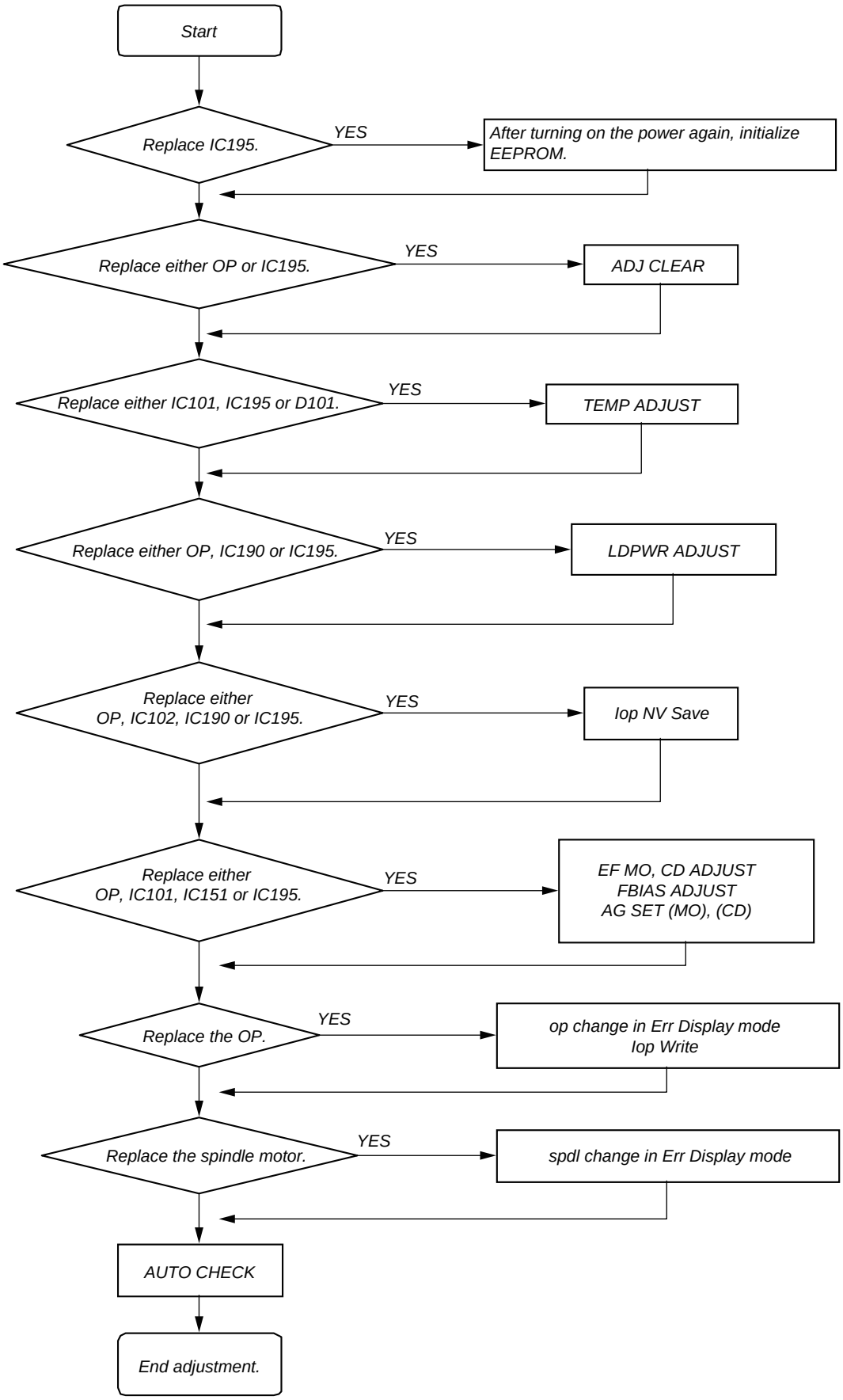
5-1. PARTS REPLACEMENT AND ADJUSTMENT

If a defect such as dropout caused by the OP is found, check the following.

Check Procedure Before Replacement



Flow During Adjustment



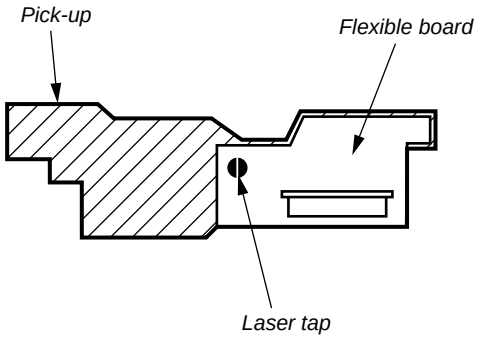
5-2. PRECAUTIONS FOR CHECKING LASER DIODE EMISSION

To check the emission of the laser diode during adjustments, never view directly from the top as this may lose your eye-sight.

5-3. PRECAUTIONS FOR USE OF OPTICAL PICK-UP (KMS-260B)

As the laser diode in the optical pick-up is easily damaged by static electricity, solder the laser tap of the flexible board of the optical pick-up when using it.

Before disconnecting the connector, desolder first. Before connecting the connector, be careful not to remove the solder. Also take adequate measures to prevent damage by static electricity. Handle the flexible board with care as it breaks easily.



Optical pick-up flexible board

5-4. PRECAUTIONS FOR ADJUSTMENTS

1. When replacing the following parts, perform the adjustments and checks with ○ in the order shown in the following table.

	Replacement parts						
	Optical Pick-up	IC101	IC102	IC151	IC190	IC195	D101
Initial setting of adjustment value	○	×	×	×	×	○	×
Recording of Iop information	○	×	×	×	×	○	×
TEMP CHECK	×	○	×	×	×	○	○
Laser power adjustment	○	×	×	×	○	○	×
Iop NV Save	○	×	○	×	○	○	×
Traverse adjustment	○	○	×	○	×	○	×
Focus bias adjustment	○	○	×	○	×	○	×
Auto gain adjustment	○	○	×	○	×	○	×
AUTO CHECK	○	○	×	○	○	○	×

2. Set the test mode when performing adjustments.
   After completing the adjustments, release the test mode.
3. Perform only the adjustments to be needed in the order shown.
4. Use the following tools and measuring devices.
   - Check Disc (MD) TDYS-1
     (Part No. 4-963-646-01)
   - Test Disc (MDW-74/GA-1) (Part No. 4-229-747-01)
   - Laser power meter LPM-8001 (Part No. J-2501-046-A)
     or
   - MD Laser power meter 8010S (Part No. J-2501-145-A)
   - Oscilloscope (Measure after performing CAL of prove)
   - Digital voltmeter
   - Thermometer
   - Jig for checking BD board waveform
     (Part No. : J-2501-196-A for MDM-7A)
5. When observing several signals on the oscilloscope, etc., make sure that VC and ground do not connect inside the oscilloscope.
   (VC and ground will become short-circuited)
6. Using the above jig enables the waveform to be checked without the need to solder.
   (Refer to Servicing Notes on page 6)
7. As the disc used will affect the adjustment results, make sure that no dusts nor fingerprints are attached to it.

Laser power meter

When performing laser power checks and adjustment (electrical adjustment), use of the new MD laser power meter 8010S (Part No. J-2501-145-A) instead of the conventional laser power meter is convenient.

It sharply reduces the time and trouble to set the laser power meter sensor onto the objective lens of optical pick-up.

5-5. CREATING CONTINUOUSLY-RECORDED DISC

* This disc is used in focus bias adjustment and MO error rate check. The following describes how to create an MO continuous recording disc.

1. Insert a disc (MDW-74/GA-1)(blank disc) commercially available.
2. Turn the [⏮ AMS ⏭] knob and display “CREC 1 MODE” (C35).
3. Press the [YES] button again to display “CREC 1 MID”. Display “CREC (0300)” and start to recording.
   (Complete recording within 5 minutes.)
4. Press the [MENU/NO] button and stop recording .
5. Press the [EJECT ⏏] button and remove the disc.

The above has been how to create a continuous recorded data for the focus bias adjustment and MO error rate check.

Note: Be careful not to apply vibration during continuous recording.

5-6. CHECK PRIOR TO REPAIRS

These checks are performed before replacing parts to determine the faulty locations.

5-6-1. TEMP CHECK

When performing adjustments, set the internal temperature and room temperature of 22 °C to 28 °C. Accurate checks are not possible because the temperature of the IC and diode, etc. rises as time goes by after the power is turned on. If the check is performed in this state, wait for some minutes and perform the check again.

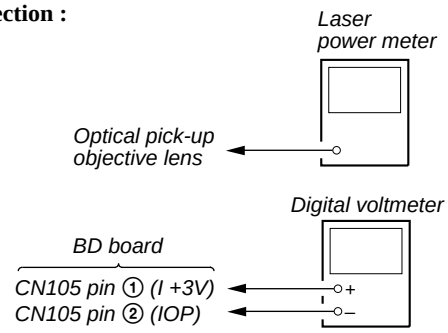
Checking Procedure:

1. Turn the [⏮ AMS ⏭] knob to display "TEMP CHECK" (C12).
2. Press the [YES] button.
3. "T=@@(##) [OK" should be displayed. If "T=@@ (##) [NG" is displayed, it means that the results are bad.
   (@@ indicates the current value set, and ## indicates the value written in the non-volatile memory)

5-6-2. Laser Power Check

Before checking, check the IOP value of the optical pick-up. (Refer to 5-8. Recording and Displaying IOP Information)

Connection :



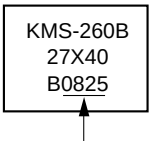
Checking Procedure:

1. Load the laser power meter into the disc inlet and set it on the objective lens of the optical pick-up. (When it cannot be set properly, press the [◀◀] button or [▶▶] button to move the optical pick-up)
   Connect the digital voltmeter to CN105 pin ① (I+3V) and CN105 pin ② (IOP) on the BD board.
2. Then, turn the [⏮ AMS ⏭] knob to display "LDPWR CHECK" (C13).
3. Press the [YES] button once to display "LD 0.9 mW $ ⬚⬚". Check that the laser power meter satisfy the specified value.
   Specified value:
   Laser power meter reading: 0.84 to 0.92 mW
4. Press the [YES] button once more to display "LD 7.0 mW $ ⬚⬚". Check that the laser power meter and digital voltmeter satisfy the specified value.

Specified Value:

Laser power meter reading : 7.0 ± 0.2 mW
Digital voltmeter reading : Value on the optical pick-up label ±10%

(Optical pick-up label)



IOP = 82.5 mA in this case
IOP (mA) = Digital voltmeter reading (mV)/1 (Ω)

5. Press the [MENU/NO] button to display "LDPWR CHECK" and stop the laser emission.
   (The [MENU/NO] button is effective at all times to stop the laser emission)

Note: After step 4, each time the [YES] button is pressed, the display will be switched "LD 0.7 mW $ ⬚⬚", "LD 6.2 mW $ ⬚⬚", and "LD Wp ﾎｾｲ $ ⬚⬚". Nothing needs to be performed here.

5-6-3. Iop Compare

The current IOP value when 7 mW laser power is output and the reference IOP value (normally, the value when shipped from the factory) written in the non-volatile memory are compared and the degree of increase or decrease is shown as a percentage.

Note: Do the following operation when the temperature of the optical pick-up is almost the same as room temperature.

Operation Procedure:

1. Turn the [⏮ AMS ⏭] knob to display "Iop Compare".
2. Press the [YES] button to start measurement.
3. After the measurement is complete, the display changes to "±xx% yy". "xx" indicates the degree of increase or decrease. OK or NG is shown in "yy", which indicates whether the increase or decrease is acceptable.
4. Press the [MENU/NO] button to end Iop Compare.

5-6-4. AUTO CHECK

This test mode automatically performs C-REC and C-PLAY and checks mainly the characteristics of the optical pick-up. To execute the test mode, first check the laser power and perform AUTO CHECK after Iop Compare.

Operation Procedure:

1. Press the [YES] button. If "LDPWR ﾐﾁｪｯｸ " appears, which means the laser power has not been checked, first check the laser power and perform Iop Compare. Then, repeat this step.
2. If there is a disc in the mechanism deck, the disc is forcibly ejected. After "DISC IN" appears, load a recordable test disc (MDW-74/GA-1).
3. When the disc is loaded in step 2, the check automatically starts.
4. While "XX CHECK" is displayed, the check of the item shown in "XX" is in progress.
   After "06 check" is complete, eject the disc loaded in step 2. When "DISC IN" appears, load the TDYS-1 check disc (MD).
5. After the disc is loaded, the check automatically restarts from "07 CHECK".
6. After the check of item 12 is complete, "OK" or "NG" appears. When all items are OK, "CHECK ALL OK" appears. If even one of the items failed, "NG: xxxx" appears.

When "CHECK ALL OK" appears, there is no problem in the optical pick-up, Check the operations of the spindle motor, sled motor, etc.

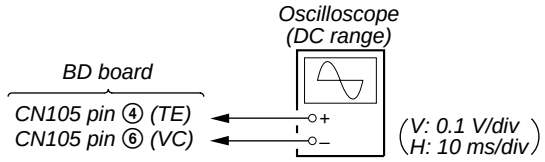
If "NG: xxxx" appears, there is an abnormality in the optical pick-up. Replace the optical pick-up.

5-6-5. Other Checks

All of the following check modes have already been checked in the section "AUTO CHECK". Therefore, normally do not check them.

1. Traverse Check

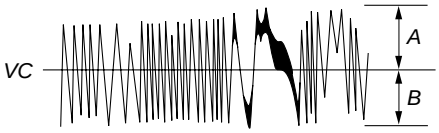
Connection :



Checking Procedure:

1. Connect an oscilloscope to CN105 pin ④ (TE) and CN105 pin ⑥ (VC) on the BD board.
2. Load a recordable disc (MDW-74/GA-1).
3. Press the ▶▶ button to move the optical pick-up outside the pit.
4. Turn the ⏮ AMS ⏭ knob to display "EF MO CHECK"(C14).
5. Press the YES button to display "EFB = □□ MO-R".
6. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not turn the ⏮ AMS ⏭ knob.

Traverse Waveform

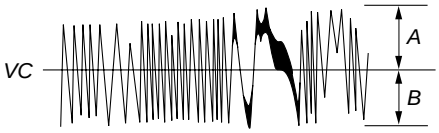


Specified value : Below 10% offset value

$$\text{Offset value (\%)} = \frac{|A - B|}{2\,(A + B)} \times 100$$

7. Press the YES button to display "EFB = □□ MO-W".
8. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not turn the ⏮ AMS ⏭ knob.

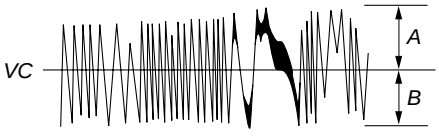
Traverse Waveform



Specified value : Below 10% offset value

9. Press the YES button to display "EFB = □□ MO-P". Then, the optical pick-up moves to the pit area automatically and servo is imposed.
10. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not turn the ⏮ AMS ⏭ knob.

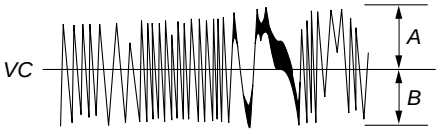
Traverse Waveform



Specified value : Below 10% offset value

11. Press the YES button to display "EF MO CHECK" The disc stops rotating automatically.
12. Press the EJECT ⏏ button and take out the disc.
13. Load the check disc (MD) TDYS-1.
14. Turn the ⏮ AMS ⏭ knob and display "EF CD CHECK" (C15).
15. Press the YES button to display "EFB = □□ CD". Servo is imposed automatically.
16. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not turn the ⏮ AMS ⏭ knob.

Traverse Waveform



Specified value : Below 10% offset value

17. Press the YES button to display "EF CD CHECK".
18. Press the EJECT ⏏ button and take out the test disc (TDYS-1).

2. Focus Bias Check

Change the focus bias and check the focus tolerance amount.

Checking Procedure :

1. Load the recorded test disk (MDW-74/GA-1). (Refer to "5-5. Creating Continuously-Recorded Disc".)
2. Turn the ⏮ AMS ⏭ knob to display "CPLAY 1 MODE" (C34).
3. Press the YES button to display "CPLAY 1MID".
4. Press the MENU/NO button when "C = □□□□ AD = □□" is displayed.
5. Turn the ⏮ AMS ⏭ knob to display "FBIAS CHECK" (C16).
6. Press the YES button to display "□□□□/□□ c = □□". The first four digits indicate the C1 error rate, the two digits after [/] indicate ADER, and the 2 digits after [c =] indicate the focus bias value. Check that the C1 error is below 20 and ADER is below 2.
7. Press the YES button to display "□□□□/□□ b = □□". Check that the C1 error is about 100 and ADER is below 2.
8. Press the YES button to display "□□□□/□□ a = □□". Check that the C1 error is about 100 and ADER is below 2.
9. Press the MENU/NO button, then press the EJECT ⏏ button and take out the test disc.

3. C PLAY Checking

a. MO Error Rate Check

Checking Procedure :

1. Load the recorded test disk (MDW-74/GA-1). (Refer to "5-5. Creating Continuously-Recorded Disc".)
2. Turn the [I◁◁ AMS ▷▷I] knob to display "CPLAY 1 MODE" (C34).
3. Press the [YES] button to display "CPLAY 1 MID".
4. The display changes to "C = □□□□ AD = □□".
5. If the C1 error rate is below 20, check that ADER is 00.
6. Press the [MENU/NO] button to stop playback, then press the [EJECT ⏏] button and take out the test disc.

b. CD Error Rate Check

Checking Procedure :

1. Load the check disc (MD) TDYS-1.
2. Turn the [I◁◁ AMS ▷▷I] knob to display "CPLAY 1 MODE" (C34).
3. Press the [YES] button twice to display "CPLAY 1 MID".
4. The display changes to "C = □□□□ AD = □□".
5. Check that the C1 error rate is below 20.
6. Press the [MENU/NO] button to stop playback, then press the [EJECT ⏏] button and take out the check disc.

4. Self-Recording/playback Check

• Create a continuous recording disc using the unit to be repaired and check the error rate.

1. Load a recordable test disc (MDW-74/GA-1).
2. Turn the [I◁◁ AMS ▷▷I] knob to display "CREC 1 MODE" (C34).
3. Press the [YES] button to display "CREC 1 MID".
4. [REC ●] lights and "CREC(@@@@" (@@@@ indicates the address.). Then recording starts.
5. About one minute later, press the [MENU/NO] button to stop the continuous recording.
6. Turn the [I◁◁ AMS ▷▷I] knob to display "CPLAY 1 MODE" (C34).
7. Press the [YES] button to display "CPLAY 1 MID".
8. The display changes to "C1 = □□□□ AD = □□".
9. Check that the C1 error rate is below 20 and ADER is below 2.
10. Press the [MENU/NO] button to stop playback and press the [EJECT ⏏] button to remove the disc.

5-7. INITIAL SETTING OF ADJUSTMENT VALUE

Note: Mode which sets the adjustment results recorded in the non-volatile memory to the initial setting value. However the results of the temperature compensation offset adjustment will not change to the initial setting value.
If initial setting is performed, perform all adjustments again excluding the temperature compensation offset adjustment.
For details of the initial setting, refer to "5-4. Precautions for Adjustments" and execute the initial setting before the adjustment as required.

Setting Procedure :

1. Turn the [I◁◁ AMS ▷▷I] knob to display "ADJ CLEAR" (C28).
2. Press the [YES] button. "Complete!" will be displayed momentarily and initial setting will be executed, after which "ADJ CLEAR" will be displayed.

5-8. RECORDING AND DISPLAYING THE IOP INFORMATION

The IOP data can be recorded in the non-volatile memory. The IOP value on the optical pick-up label and the IOP value after the adjustment will be recorded. Recording these data eliminates the need to read the label on the optical pick-up.

Recording Procedure :

1. Turn the [I◁◁ AMS ▷▷I] knob to display "Iop Write" (C05), and press the [YES] button.
2. The display becomes Ref=@@@/@ (@ is an arbitrary number) and the numbers which can be changed will blink.
3. Input the IOP value on the optical pick-up label.
   To select the number : Turn the [I◁◁ AMS ▷▷I] knob.
   To select the digit : Press the [I◁◁ AMS ▷▷I] knob
4. When the [YES] button is pressed, the display becomes "Measu=@@@.@" (@ is an arbitrary number).
5. As the adjustment results are recorded for the 6 value. Leave it as it is and press the [YES] button.
6. "Complete!" will be displayed momentarily. The value will be recorded in the non-volatile memory and the display will become "Iop Write".

Display Procedure :

1. Turn the [I◁◁ AMS ▷▷I] knob to display "Iop Read"(C26).
2. "@@.@/##.#" is displayed and the recorded contents are displayed.
   @@.@ indicates the IOP value on the optical pick-up label.
   ##.# indicates the IOP value after adjustment
3. To end, press the [I◁◁ AMS ▷▷I] button or [MENU/NO] button to display "Iop Read".

5-9. TEMPERATURE COMPENSATION OFFSET ADJUSTMENT

Save the temperature data at that time in the non-volatile memory as 25 ˚C reference data.

Note:
1. Usually, do not perform this adjustment.
2. Perform this adjustment in an ambient temperature of 22 ˚C to 28 ˚C. Perform it immediately after the power is turned on when the internal temperature of the unit is the same as the ambient temperature of 22 ˚C to 28 ˚C.
3. When D101 has been replaced, perform this adjustment after the temperature of this part has become the ambient temperature.

Adjusting Procedure :

1. Turn the [I◁◁ AMS ▷▷I] knob to display "TEMP ADJUS" (C03).
2. Press the [YES] button to select the "TEMP ADJUS" mode.
3. "TEMP = □□ [OK" and the current temperature data will be displayed.
4. To save the data, press the [YES] button.
   When not saving the data, press the [MENU/NO] button.
5. When the [YES] button is pressed, "TEMP = □□ SAVE" will be displayed and turned back to "TEMP ADJUS" display then. When the [MENU/NO] button is pressed, "TEMP ADJUS" will be displayed immediately.

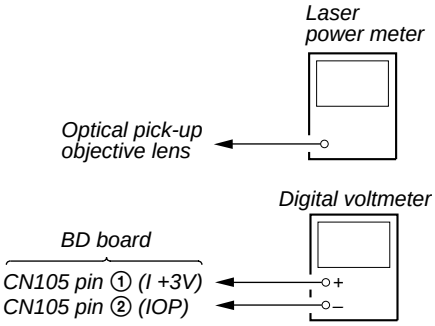
Specified Value :

The "TEMP = □□" should be within "E0 - EF", "F0 - FF", "00 - 0F", "10 - 1F" and "20 - 2F".

5-10. LASER POWER ADJUSTMENT

Check the IOP value of the optical pick-up before adjustments. (Refer to 5-8. Recording and Displaying IOP Information)

Connection :



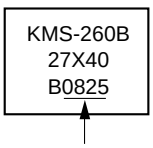
Adjusting Procedure :

1. Load the laser power meter into the disc inlet and set it on the objective lens of the optical pick-up. (When it cannot be set properly, press the ◀◀ button or ▶▶ button to move the optical pick-up)
   Connect the digital voltmeter to CN105 pin ① (I+3V) and CN105 pin ② (IOP) on the BD board.
2. Turn the ⏮ AMS ⏭ knob to display "LDPWR ADJUS" (C04).
3. Press the YES button once to display "LD 0.9 mW $ ⬚⬚".
4. Turn the ⏮ AMS ⏭ knob so that the reading of the laser power meter becomes 0.85 to 0.91 mW. Press the YES button after setting the range knob of the laser power meter, and save the adjustment results in the non-volatile memory. ("LD SAVE $ ⬚⬚" will be displayed for a moment)
5. Then "LD 7.0 mW $ ⬚⬚" will be displayed.
6. Turn the ⏮ AMS ⏭ knob so that the reading of the laser power meter becomes 6.9 to 7.1 mW, press the YES button to save it. ("LD SAVE $ ⬚⬚" will be displayed for a moment)
   Note: Do not perform the emission with 7.0 mW more than 15 seconds continuously.
7. Then, turn the ⏮ AMS ⏭ knob to display "LDPWR CHECK" (C13).
8. Press the YES button once to display "LD 0.9 mW $ ⬚⬚". Check that the reading of the laser power meter become 0.85 to 0.91 mW.
9. Press the YES button once more to display "LD 7.0 mW $ ⬚⬚". Check that the reading the laser power meter and digital voltmeter satisfy the specified value.
   Note down the digital voltmeter reading value.

Specified Value:

Laser power meter reading : 7.0 ± 0.2 mW
Digital voltmeter reading : Value on the optical pick-up label ±10%

(Optical pick-up label)



IOP = 82.5 mA in this case
IOP (mA) = Digital voltmeter reading (mV)/1 (Ω)

10. Press the MENU/NO button to display "LDPWR CHECK" and stop the laser emission.
    (The MENU/NO button is effective at all times to stop the laser emission.)
11. Turn the ⏮ AMS ⏭ knob to display "Iop Write"(C05).
12. Press the YES button. When the display becomes Ref=@@@.@ (@ is an arbitrary number), press the YES button to display "Measu=@@@.@" (@ is an arbitrary number).
13. The numbers which can be changed will blink. Input the Iop value noted down at step 9.
    To select the number : Turn the ⏮ AMS ⏭ knob.
    To select the digit : Press the ⏮ AMS ⏭ knob.
14. When the YES button is pressed, "Complete!" will be displayed momentarily. The value will be recorded in the non-volatile memory and the display will become "Iop Write".

Note: After step 4, each time the YES button is pressed, the display will be switched "LD 0.7 mW $ ⬚⬚", "LD 6.2 mW $ ⬚⬚", and "LD Wp ﾎｾｲ $ ⬚⬚". Nothing needs to be performed here.

5-11. Iop NV Save

Write the reference value in the non-volatile memory for "Iop Comparer". Do not perform this operation other than when performing the laser power adjustment while replacing the OP, etc. and when replacing IC102 as the reference value is rewritten. Otherwise, deterioration judgment of the OP is wrong.

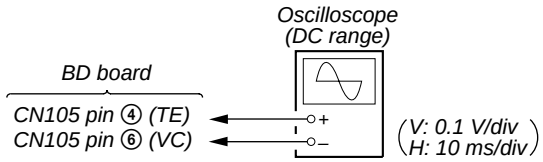
Note: Perform this operation when the temperature of the optical pick-up is almost same as the room temperature.

Operation Procedure:

1. Turn the ⏮ AMS ⏭ knob to display "Iop NV Save" (C06).
2. Press the YES button to display "Iop [stop]".
3. After the display changes to "Iop=xxsave?", press the YES button.
4. "Complete!" is displayed momentarily and the display changes to "Iop 7.0mW".
5. After the display changes to "Iop=yysave?", press the YES button.
6. The "Complete!" message indicates that the operation has ended.

5-12. TRAVERSE ADJUSTMENT

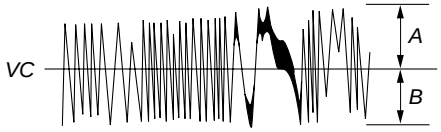
Connection:



Adjusting Procedure:

1. Connect an oscilloscope to CN105 pin ④ (TE) and CN105 pin ⑥ (VC) on the BD board.
2. Load a recordable test disc (MDW-74/GA-1).
3. Press the [▶▶] button to move the optical pick-up outside the pit.
4. Turn the [I◁◁ AMS ▷▷I] knob to display "EF MO ADJUS" (C07).
5. Press the [YES] button to display "EFB = ⬚ MO-R".
6. Turn the [I◁◁ AMS ▷▷I] knob so that the waveform of the oscilloscope becomes the specified value.
   (When the [I◁◁ AMS ▷▷I] knob is turned, the ⬚ of "EFB= ⬚ MO-R" changes and the waveform changes.) In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.

Traverse Waveform

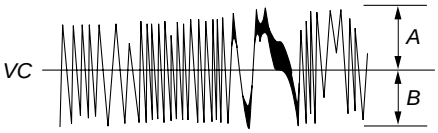


Specification A = B

7. Press the [YES] button and save the result of adjustment to the non-volatile memory ("EFB = ⬚ SAV" will be displayed for a moment. Then "EFB = ⬚ MO-W" will be displayed).

8. Turn the [I◁◁ AMS ▷▷I] knob so that the waveform of the oscilloscope becomes the specified value.
   (When the [I◁◁ AMS ▷▷I] knob is turned, the ⬚ of "EFB- ⬚ MO-W" changes and the waveform changes.) In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.

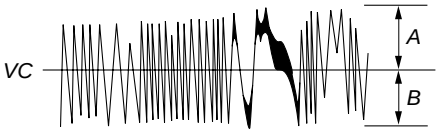
Traverse Waveform



Specification A = B

9. Press the [YES] button, and save the adjustment results in the non-volatile memory. ("EFB = ⬚ SAV" will be displayed for a moment)
10. "EFB = ⬚ MO-P" will be displayed.
    The optical pick-up moves to the pit area automatically and servo is imposed.
11. Turn the [I◁◁ AMS ▷▷I] knob until the waveform of the oscilloscope moves closer to the specified value.
    In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.

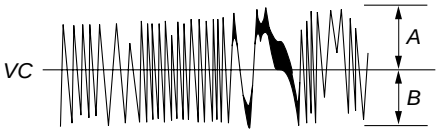
Traverse Waveform



Specification A = B

12. Press the [YES] button, and save the adjustment results in the non-volatile memory. ("EFB = ⬚ SAV" will be displayed for a moment.)
    Next "EF MO ADJUS" is displayed. The disc stops rotating automatically.
13. Press the [EJECT ⏏] button and take out the disc.
14. Load the check disc (MD) TDYS-1.
15. Turn the [I◁◁ AMS ▷▷I] knob to display "EF CD ADJUS" (C08).
16. Press the [YES] button to display "EFB = ⬚ CD". Servo is imposed automatically.
17. Turn the [I◁◁ AMS ▷▷I] knob so that the waveform of the oscilloscope moves closer to the specified value.
    In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.

Traverse Waveform



Specification A = B

18. Press the [YES] button, display "EFB = ⬚ SAV" for a moment and save the adjustment results in the non-volatile memory.
    Next "EF CD ADJUS" will be displayed.
19. Press the [EJECT ⏏] button and take out the test disc TDYS-1.

5-13. FOCUS BIAS ADJUSTMENT

Adjusting Procedure :

1. Load the continuously-recorded disc (MDW-74/GA-1). (Refer to "5-5. Creating Continuously-Recorded Disc")
2. Turn the [⏮ AMS ⏭] knob to display "CPLAY 1 MODE" (C34).
3. Press the [YES] button to display "CPLAY 1 MID".
4. Press the [MENU/NO] button when "C = □□□□ AD = □□" is displayed.
5. Turn the [⏮ AMS ⏭] knob to display "FBIAS ADJUS" (C09).
6. Press the [YES] button to display "□□□□/□□ a = □□".
   The first four digits indicate the C1 error rate, the two digits after [/] indicate ADER, and the 2 digits after [a =] indicate the focus bias value.
7. Turn the [⏮ AMS ⏭] knob clockwise and find the focus bias value at which the C1 error rate becomes about 200.
8. Press the [YES] button to display "□□□□/□□ b = □□".
9. Turn the [⏮ AMS ⏭] knob counterclockwise and find the focus bias value at which the C1 error rate becomes about 200. The C1 error rate must be almost same as the value set at step 7.
10. Press the [YES] button to display "□□□□/□□ c = □□".
11. Check that the C1 error rate is below 20 and ADER is 00. Then press the [YES] button.
12. If the "(□□)" in "□□ - □□ - □□ (□□)" is above 20, press the [YES] button.
    If below 20, press the [MENU/NO] button and repeat the adjustment from step 2.
13. Press the [EJECT ⏏] button and take out the disc.

Note 1: The relation between the C1 error and focus bias is as shown in the following figure. Find points A and B in the following figure using the above adjustment. The focal point position C is automatically calculated from points A and B.

Note 2: As the C1 error rate changes, perform the adjustment using the average value.

5-14. ERROR RATE CHECK

5-14-1. CD Error Rate Check

Checking Procedure :

1. Load the check disc (MD) TDYS-1.
2. Turn the [⏮ AMS ⏭] knob and display "CPLAY 1 MODE" (C34).
3. Press the [YES] button and display "CPLAY 1 MID".
4. The display changes to "C = □□□□ AD = □□".
5. Check that the C1 error rate is below 20.
6. Press the [MENU/NO] button to stop playback, then press the [EJECT ⏏] button and take out the check disc.

5-14-2. MO Error Rate Check

Checking Procedure :

1. Load the continuously-recorded disc (MDW-74/GA-1). (Refer to "5. Creating Continuously-Recorded Disc")
2. Turn the [⏮ AMS ⏭] knob to display "CPLAY 1 MODE" (C34).
3. Press the [YES] button to display "CPLAY 1 MID".
4. The display changes to "C1 = □□□□ AD = □□".
5. If the C1 error rate is below 20, check that ADER is 00.
6. Press the [MENU/NO] button to stop playback, then press the [EJECT ⏏] button and take out the test disc.

5-15. FOCUS BIAS CHECK

Change the focus bias and check the focus tolerance amount.

Checking Procedure :

1. Load the continuously-recorded disc (MDW-74/GA-1). (Refer to "5. Creating Continuously-Recorded Disc")
2. Turn the [⏮ AMS ⏭] knob to display "CPLAY 1 MODE" (C34).
3. Press the [YES] button twice to display "CPLAY 1 MID".
4. Press the [MENU/NO] button when "C = □□□□ AD = □□" is displayed.
5. Turn the [⏮ AMS ⏭] knob to display "FBIAS CHECK" (C16).
6. Press the [YES] button to display "□□□□/□□ c = □□".
   The first four digits indicate the C1 error rate, the two digits after [/] indicate ADER, and the 2 digits after [c =] indicate the focus bias value.
   Check that the C1 error is below 20 and ADER is below 2.
7. Press the [YES] button and display "□□□□/□□ b = □□".
   Check that the C1 error is about 100 and ADER is below 2.
8. Press the [YES] button and display "□□□□/□□ a = □□".
   Check that the C1 error is about 100 and ADER is below 2
9. Press the [MENU/NO] button, then press the [EJECT ⏏] button and take out the disc.

Note: If the C1 error rate and ADER are above other than the specified value at points a (step 8. in the above) or b (step 7. in the above), the focus bias adjustment may not have been carried out properly. Perform the adjustment from the beginning again.

5-16. AUTO GAIN CONTROL OUTPUT LEVEL ADJUSTMENT

Be sure to perform this adjustment when the optical pick-up is replaced.

If the adjustment results becomes "Adjust NG!", the optical pick-up may be faulty or the servo system circuits may be abnormal.

5-16-1. CD Auto Gain Control Output Level Adjustment

Adjusting Procedure :

1. Load the check disc (MD) TDYS-1.
2. Turn the [⏮ AMS ⏭] knob to display "AG Set (CD)" (C11).
3. When the [YES] button is pressed, the adjustment will be performed automatically.
   "Complete!!" will then be displayed momentarily when the value is recorded in the non-volatile memory, after which the display changes to "AG Set (CD)".
4. Press the [EJECT ⏏] button and take out the check disc.

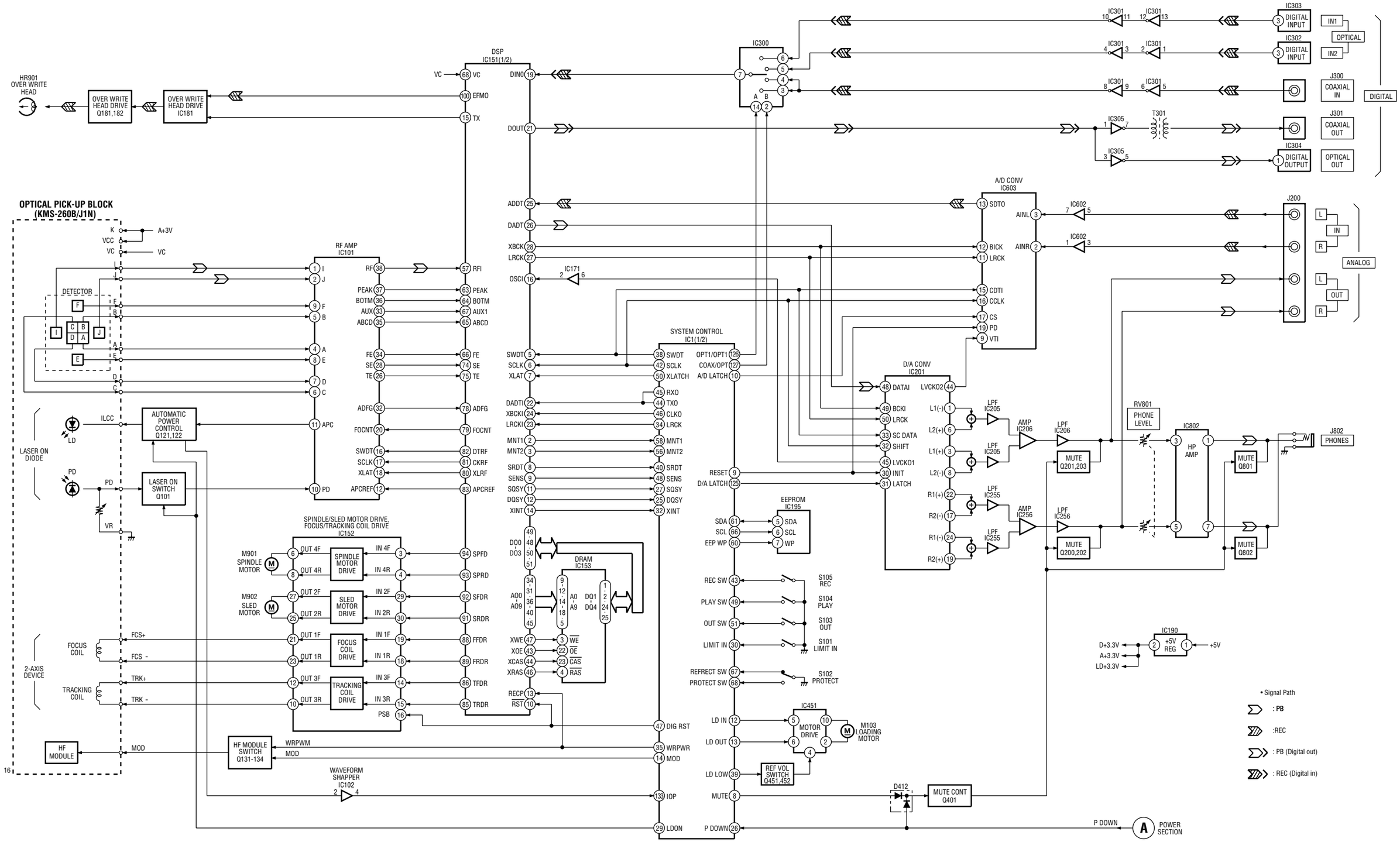
5-16-2. MO Auto Gain Control Output Level Adjustment

Adjusting Procedure :

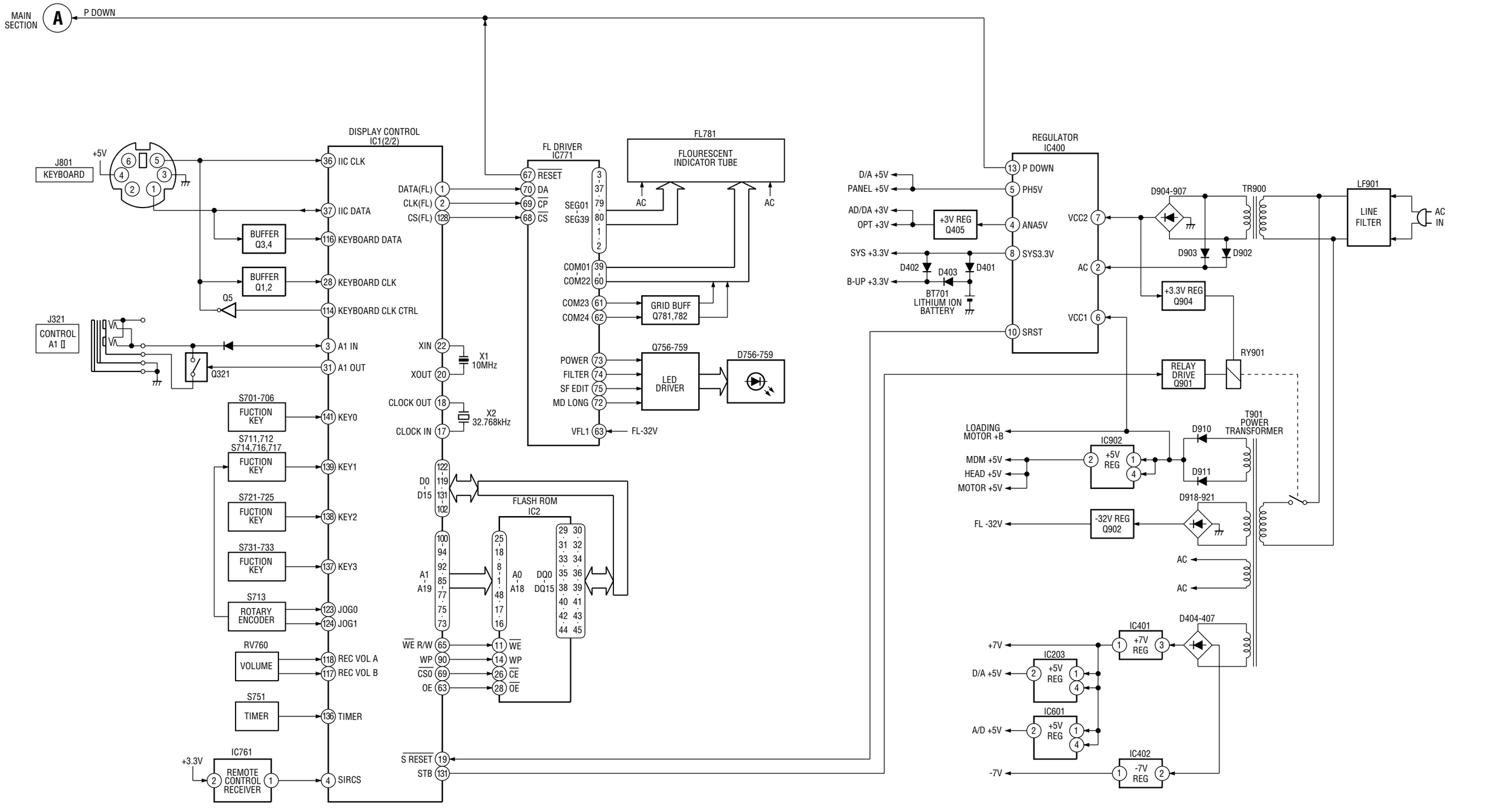
1. Load the test disc (MDW-74/GA-1).
2. Turn the [⏮ AMS ⏭] knob to display "AG Set (MO)" (C10).
3. When the [YES] button is pressed, the adjustment will be performed automatically.
   "Complete!!" will then be displayed momentarily when the value is recorded in the non-volatile memory, after which the display changes to "AG Set (MO)".
4. Press the [EJECT ⏏] button and take out the test disc.

SECTION 6
DIAGRAMS

6-1. BLOCK DIAGRAM MAIN Section



6-2. BLOCK DIAGRAM DISPLAY/POWER Section

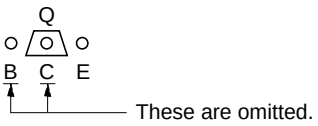


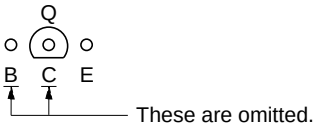
6-3. NOTE FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS
(In addition to this, the necessary note is printed in each block)

Note on Printed Wiring Board:

- ⊶—— : parts extracted from the component side.
- ○ : Through hole.
- ▒▒▒ : Pattern from the side which enables seeing.
- Indication of transistor.

Caution:	
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.





- Abbreviation
  CND : Canadian model

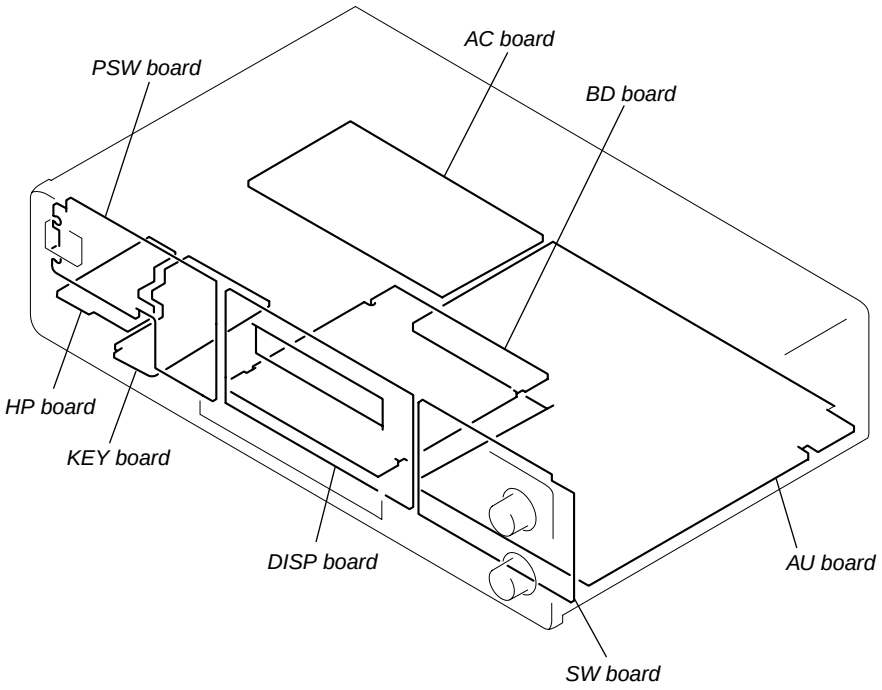
Note on Schematic Diagram:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- % : indicates tolerance.
- △ : internal component.
- ▭ : panel designation.

Note:	**Note:**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

- B+ : B+ Line.
- B− : B– Line.
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  : PB (ANALOG OUT)
  : PB (DIGITAL OUT)
  : REC (ANALOG IN)
  : REC (DIGITAL IN)
- Abbreviation
  CND : Canadian model

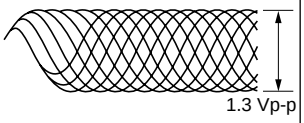
6-4. CIRCUIT BOARD LOCATION



6-5. WAVEFORMS

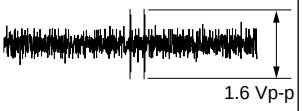
– BD Board –

① IC101 ㊳ (RF)

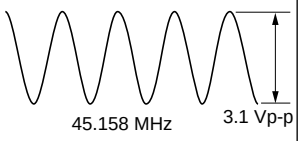


② IC101 ㉞ (FE)
(PLAY MODE)

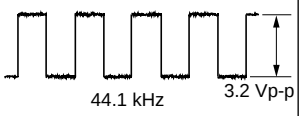
③ IC101 ㉖ (TE)
(PLAY MODE)



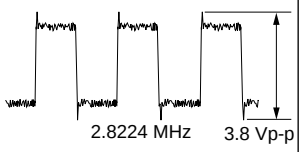
④ IC151 ⑯ (OSCI)



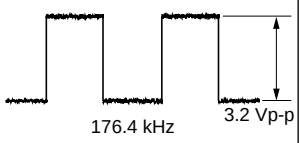
⑤ IC151 ㉗ (LRCK)



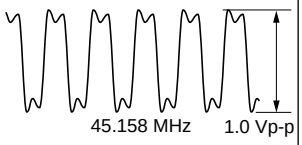
⑥ IC151 ㉘ (XBCK)



⑦ IC151 ㊿ (FS4)

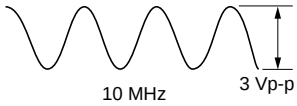


⑧ IC171 ③

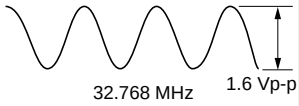


– MAIN Board –

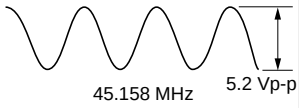
① IC1 ⑳ (XOUT)



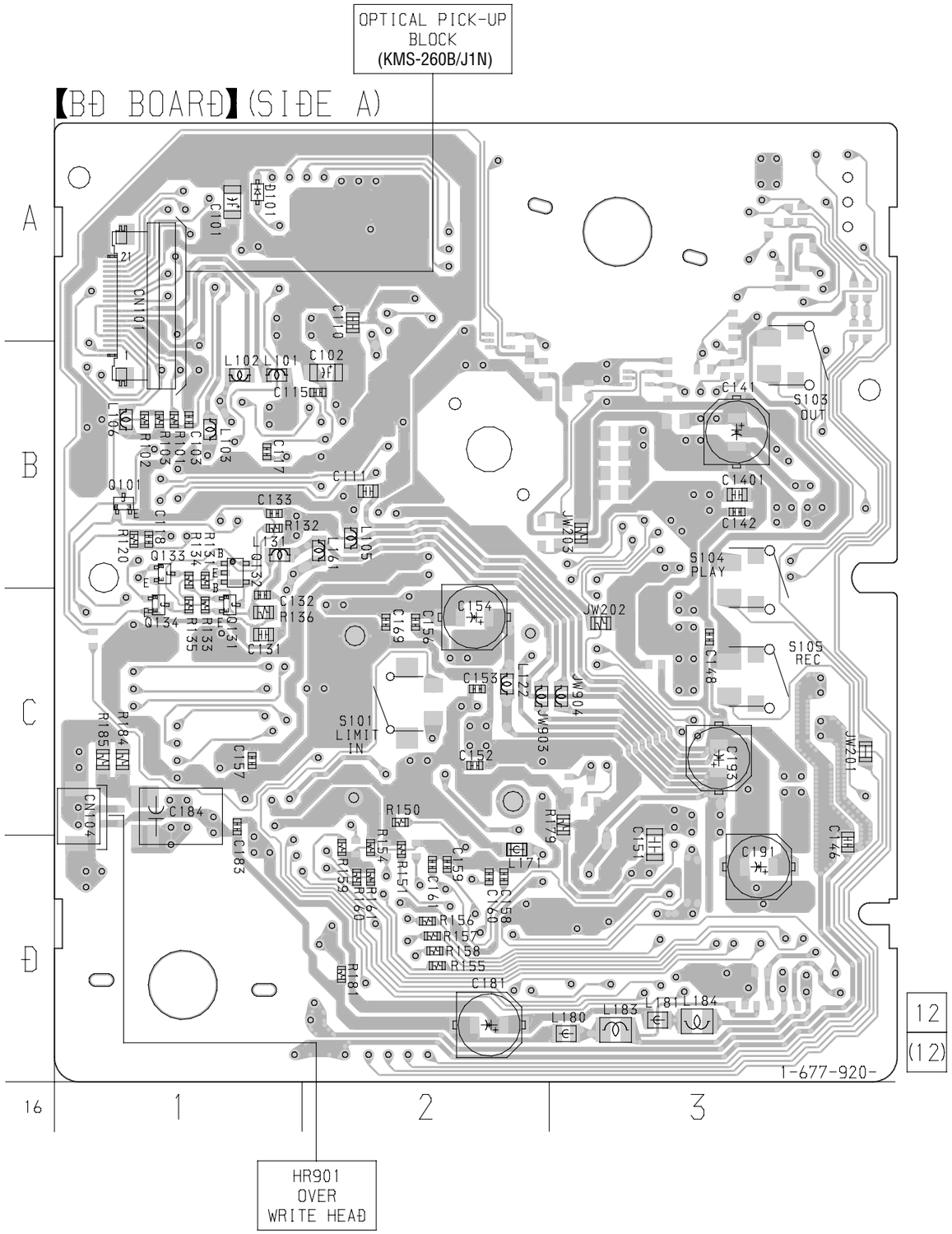
② IC1 ⑱ (CLOCK)

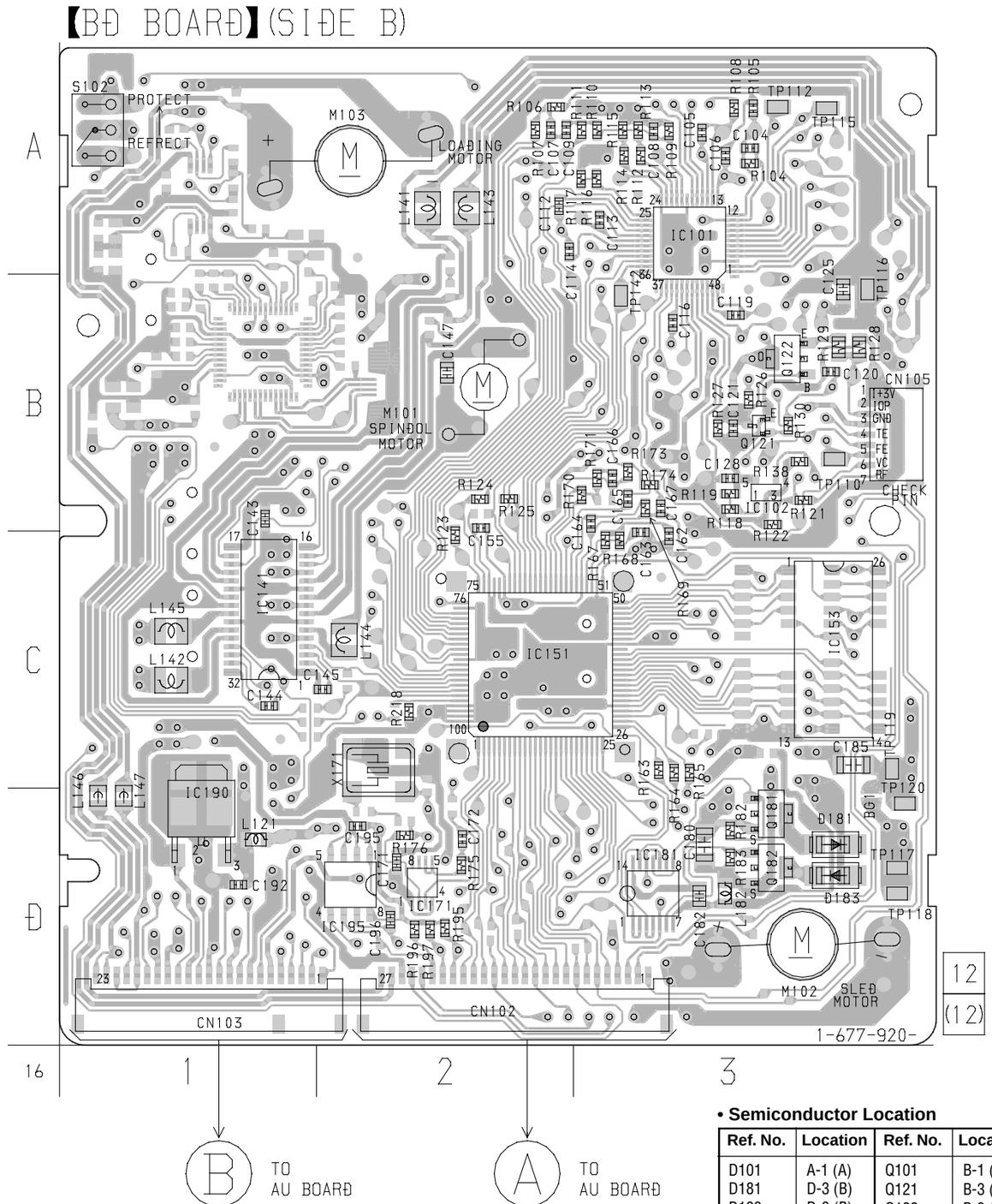


③ IC201 ⑫ (XOUT)



6-6. PRINTED WIRING BOARD BD Board • See page 33 for Circuit Board Location.



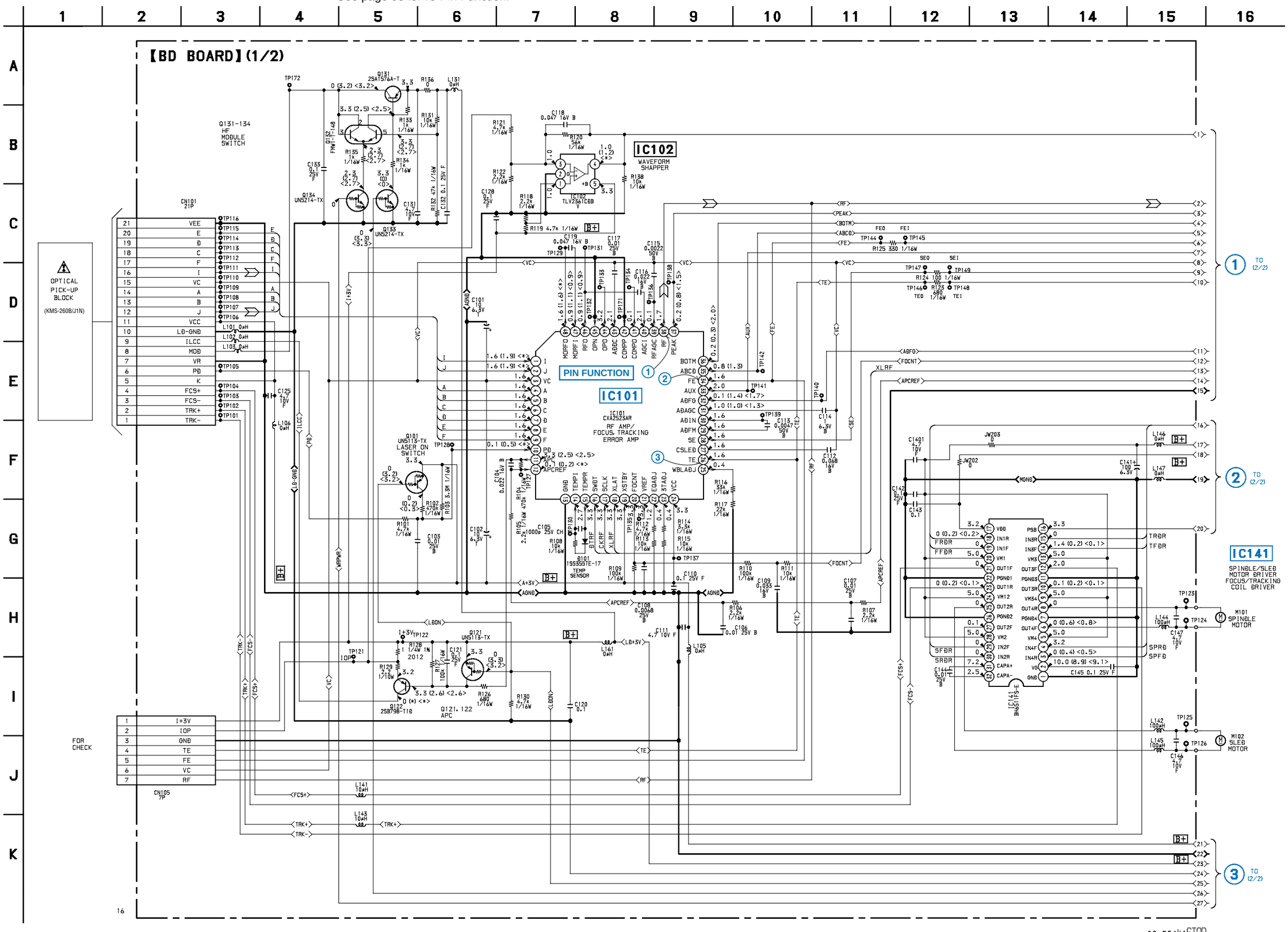


• **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location
D101	A-1 (A)	Q101	B-1 (A)
D181	D-3 (B)	Q121	B-3 (B)
D183	D-3 (B)	Q122	B-3 (B)
		Q131	C-1 (A)
IC101	A-3 (B)	Q132	B-1 (A)
IC102	B-3 (B)	Q133	B-1 (A)
IC141	C-1 (B)	Q134	C-1 (A)
IC151	C-2 (B)	Q181	D-3 (B)
IC153	C-3 (B)	Q182	D-3 (B)
IC171	D-2 (B)		
IC181	D-3 (B)		
IC190	D-1 (B)		
IC195	D-2 (B)		

6-7. SCHEMATIC DIAGRAM BD Board (1/2)

- See page 34 for Waveforms.
- See page 48 for IC Block Diagrams.
- See page 53 for IC Pin Function.



6-8. SCHEMATIC DIAGRAM BD Board (2/2)

- See page 34 for Waveforms.
- See page 49 for IC Block Diagrams.
- See page 54 for IC Pin Function.

【BD BOARD】(2/2)

PIN FUNCTION

IC151
CXD2662R
BIGITAL SSERVO SIGNAL PROCESSOR
/DIGITAL SIGNAL PROCESSOR

IC153
Ð RAM

IC195
EEPROM

IC190
+3.3VREG

IC171
ÐIVIÐER

IC181

OVER WRITE HEAD ÐRIVE

Q181, 182
OVER WRITE
HEAD ÐRIVE

Q181 2SJ278HYTR

Q182 2SK1764KYTR

CN102 27P

MÐB	1
IÐP	2
LÐÐN	3
LIMIT-IN	4
XINT	5
WRPWR	6
ÐQSY	7
SQSY	8
REC-SW	9
ÐIG-RST	10
SENS	11
PLAY-SW	12
SRÐT	13
XLATCH	14
SCLK	15
OUT-SW	16
SWÐT	17
MNT2 (XBUSY)	18
MNT1 (SHCK)	19
EEP-WP	20
SÐA	21
SCL	22
REFRECT SW	23
PROTECT SW	24
Ð-GNÐ	25
LÐ-OUT	26
LÐ-IN	27

CN103 25P

ÀÐÐT	1
LRCK	2
ÐÀÐT	3
GNÐ	4
BCK	5
MCKGNÐ	6
MCLK	7
Ð-GNÐ	8
XBCKI	9
GNÐ	10
LRCKI	11
GNÐ	12
ÐÀÐTI	13
+5V	14
ÐOUT	15
H+5V	16
HGNÐ	17
ÐINO	18
MGNÐ	19
ÐIN1	20
MGNÐ	21
M+5V	22
M+5V	23

TO (1/2) ①
TO (1/2) ②
TO (1/2) ③
TO AU BOARÐ (Page 39) Ⓐ
TO AU BOARÐ (Page 40) Ⓑ

NOTE

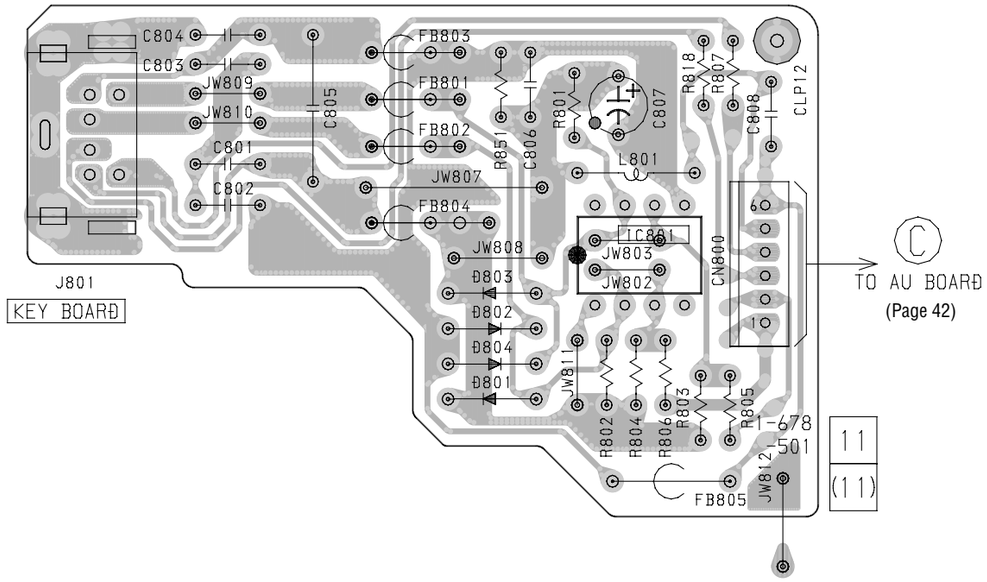
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark:STOP
  ( ):PLAY
  < >:REC
  * :can not be measured.

6-9. PRINTED WIRING BOARD HP Board/KEY Board

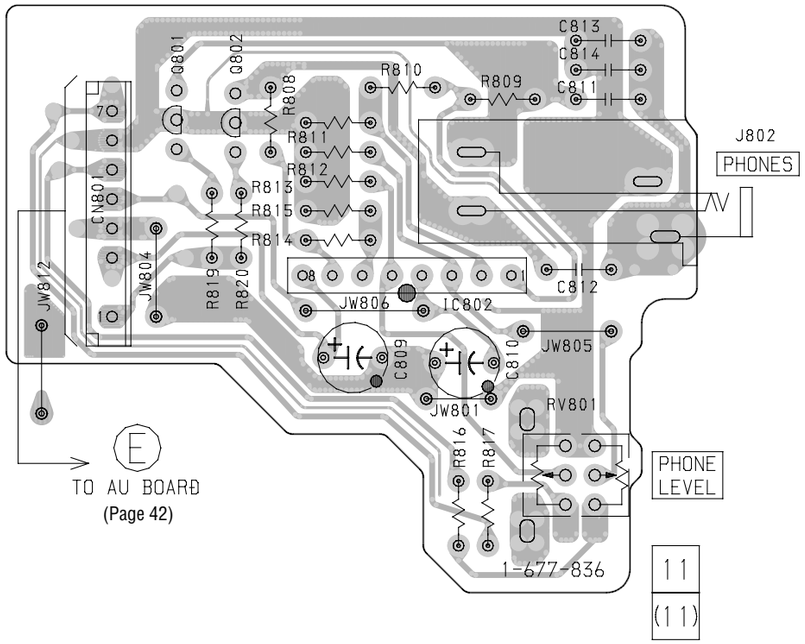
• See page 33 for Circuit Board Location.

There are few cases that the part printed on this diagram isn't mounted in this model.

【KEY BOARD】

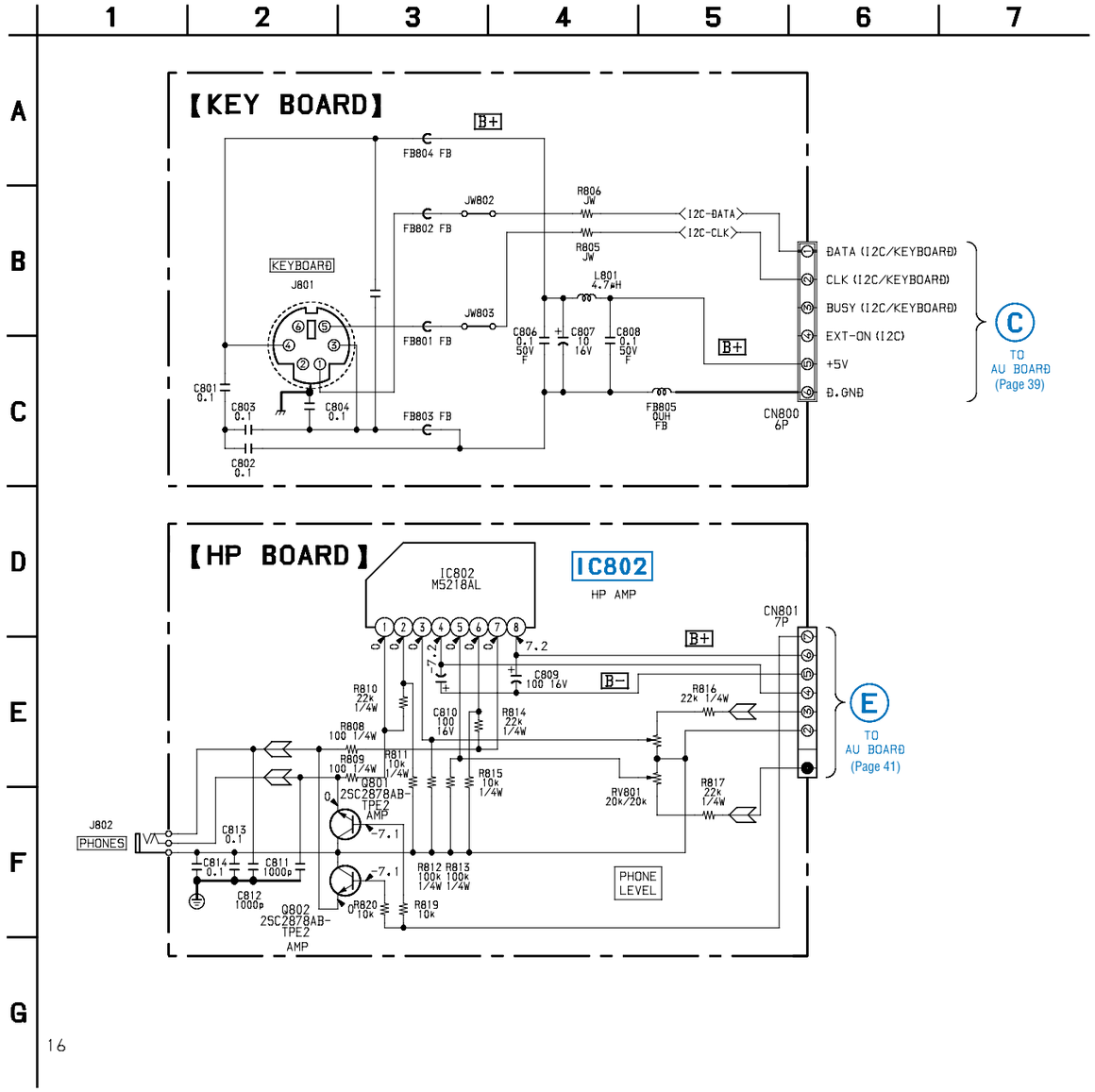


【HP BOARD】



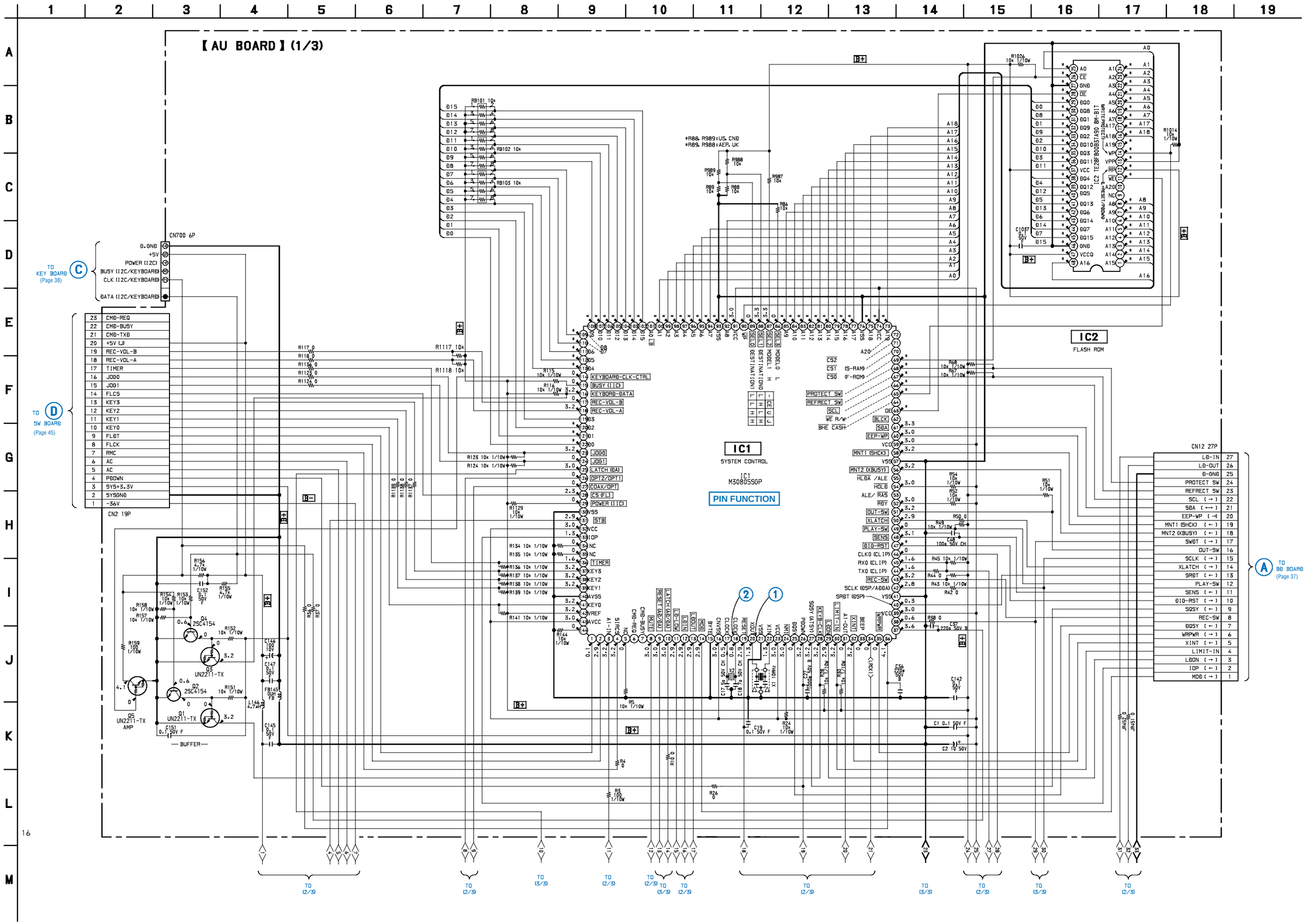
6-10. SCHEMATIC DIAGRAM HP Board/KEY Board

• See page 52 for IC Block Diagram.



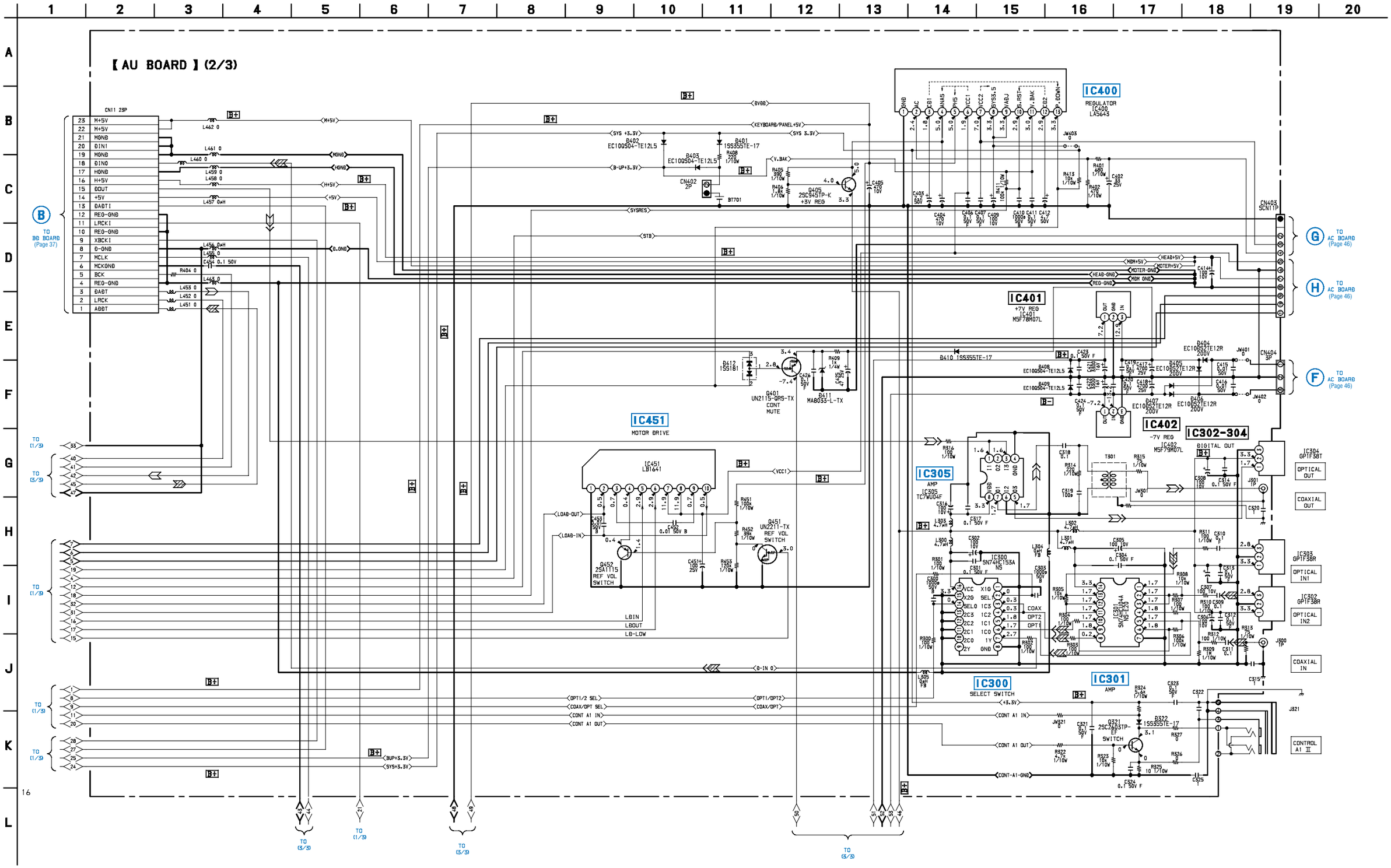
6-11. SCHEMATIC DIAGRAM MAIN Board (1/3)

• See page 34 for Waveforms.
• See page 57 for IC Pin Function.



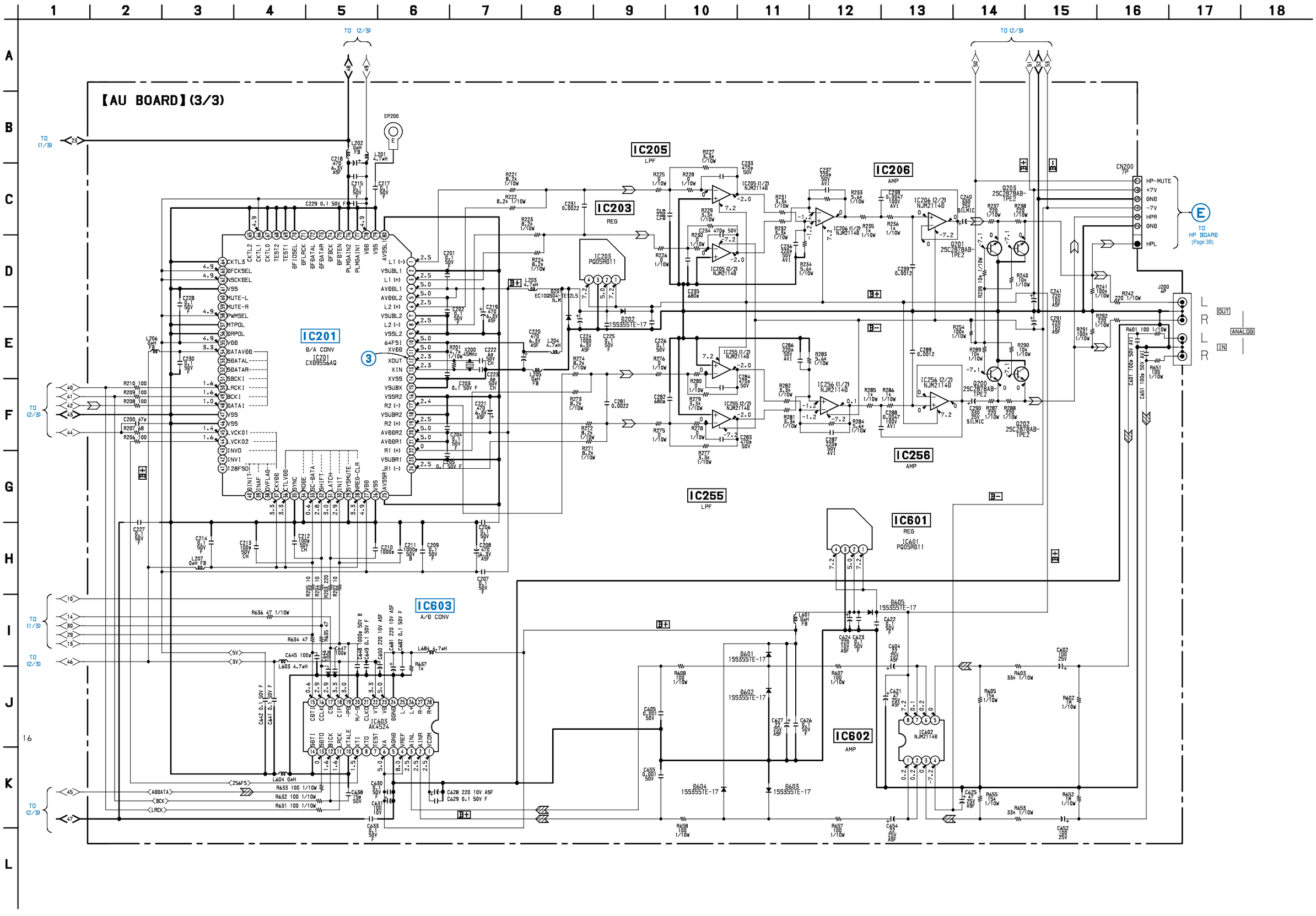
6-12. SCHEMATIC DIAGRAM MAIN Board (2/3)

• See page 50 for IC Block Diagrams.



6-13. SCHEMATIC DIAGRAM MAIN Board (3/3)

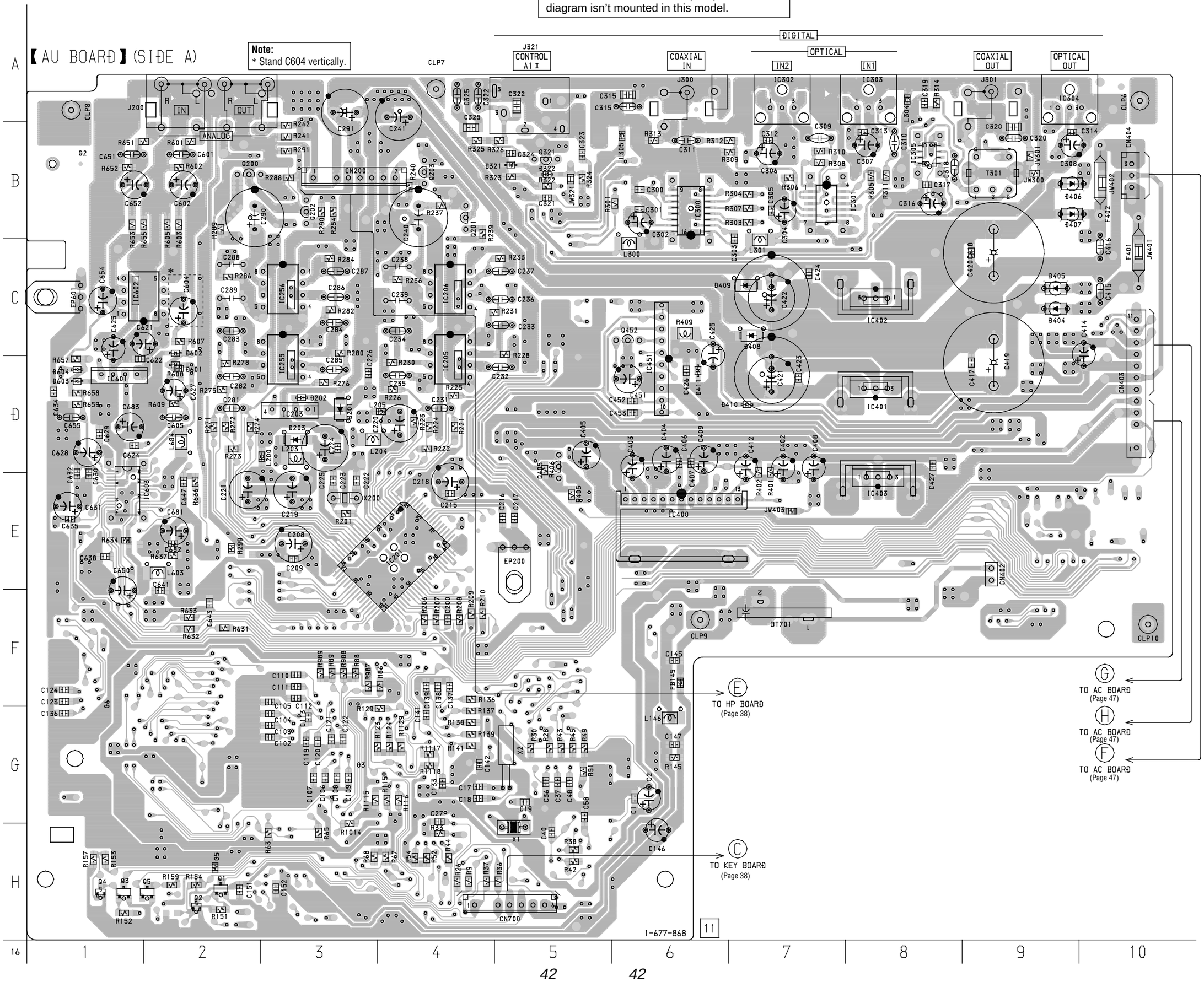
• See page 34 for Waveforms.
• See page 50 for IC Block Diagrams.



6-14. PRINTED WIRING BOARD MAIN Board (Side A)

• See page 33 for Circuit Board Location.

There are few cases that the part printed on this diagram isn't mounted in this model.

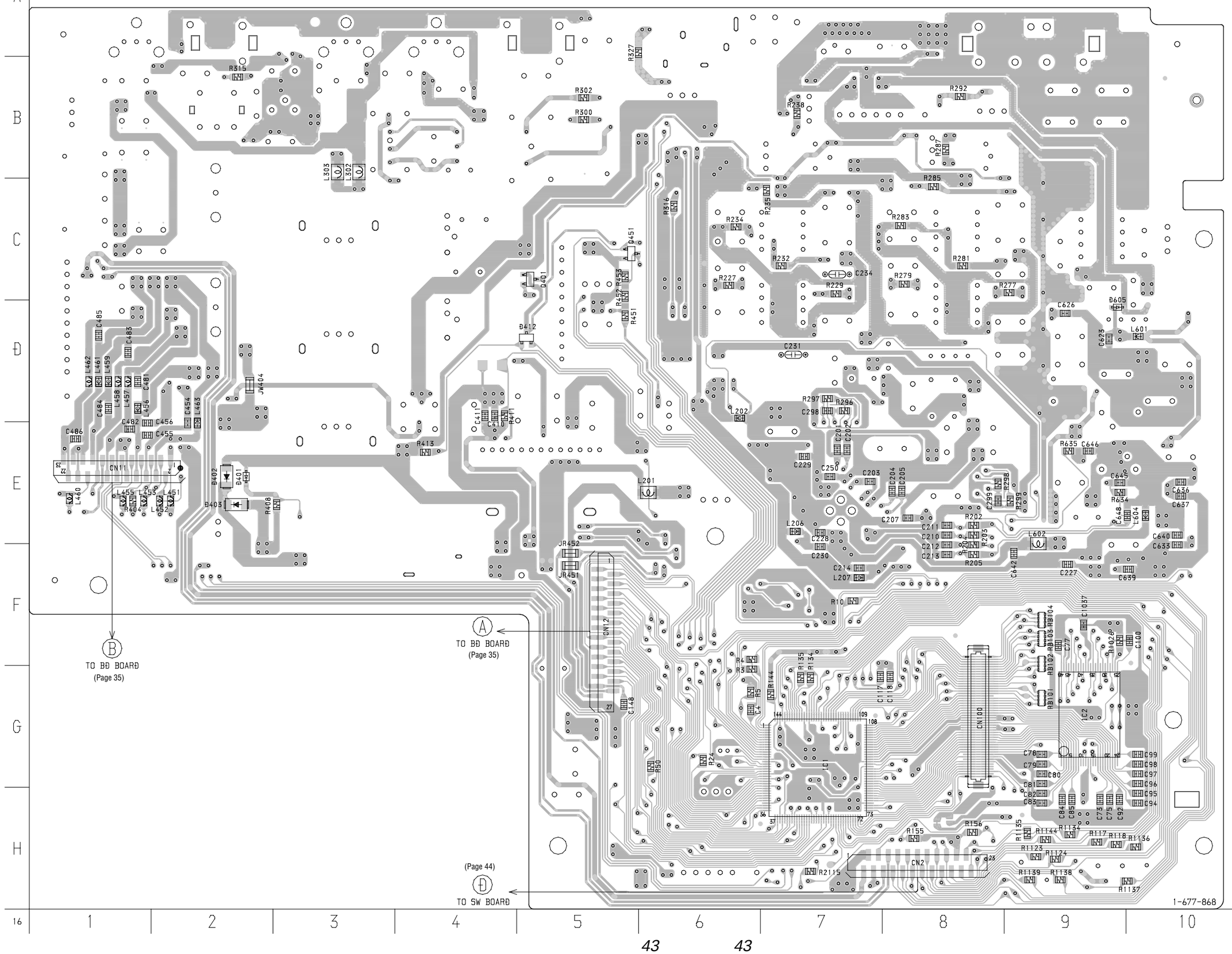


6-15. PRINTED WIRING BOARD MAIN Board (Side B)

• See page 33 for Circuit Board Location.

There are few cases that the part printed on this diagram isn't mounted in this model.

【AU BOARD】(SIDE B)



• **Semiconductor Location**

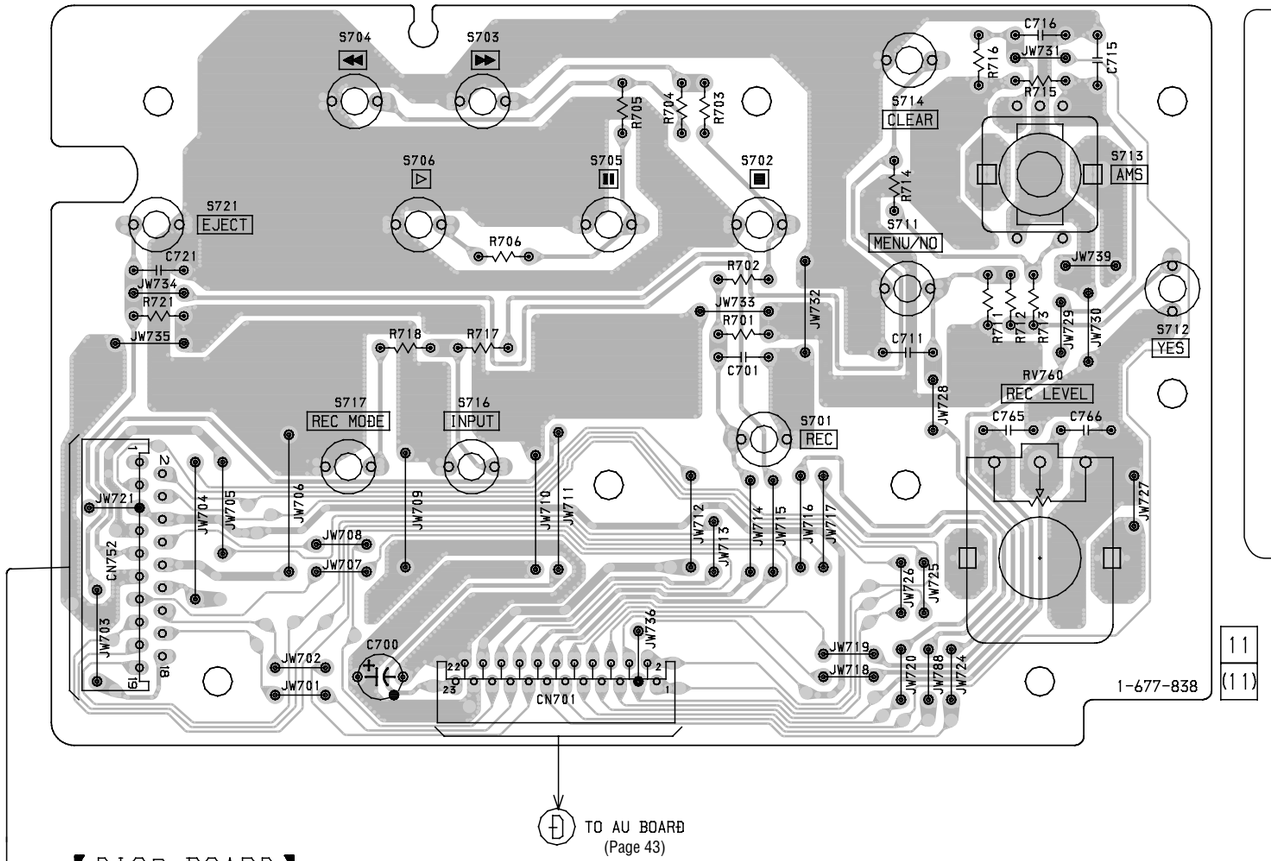
Ref. No.	Location
D201	D-3 (A)
D202	D-3 (A)
D322	B-5 (A)
D401	E-2 (B)
D402	E-2 (B)
D403	E-2 (B)
D404	C-9 (A)
D405	C-9 (A)
D406	B-9 (A)
D407	B-9 (A)
D408	C-7 (A)
D409	C-7 (A)
D410	D-7 (A)
D411	D-6 (A)
D412	D-5 (B)
D601	D-2 (A)
D602	C-2 (A)
D603	D-1 (A)
D604	D-1 (A)
D605	D-9 (B)
IC1	G-7 (B)
IC2	G-9 (B)
IC201	E-4 (A)
IC203	D-3 (A)
IC205	D-4 (A)
IC206	C-4 (A)
IC255	D-3 (A)
IC256	C-3 (A)
IC300	B-6 (A)
IC301	B-7 (A)
IC302	A-7 (A)
IC303	A-8 (A)
IC304	A-9 (A)
IC305	B-8 (A)
IC400	E-6 (A)
IC401	D-8 (A)
IC402	C-8 (A)
IC451	C-6 (A)
IC601	D-1 (A)
IC602	C-1 (A)
IC603	E-1 (A)
Q1	H-2 (A)
Q2	H-2 (A)
Q3	H-1 (A)
Q4	H-1 (A)
Q5	H-2 (A)
Q200	B-2 (A)
Q201	B-4 (A)
Q202	B-3 (A)
Q203	B-4 (A)
Q321	B-5 (A)
Q401	C-5 (B)
Q405	D-5 (A)
Q451	C-5 (B)
Q452	C-6 (A)

6-16. PRINTED WIRING BOARD PANEL Section

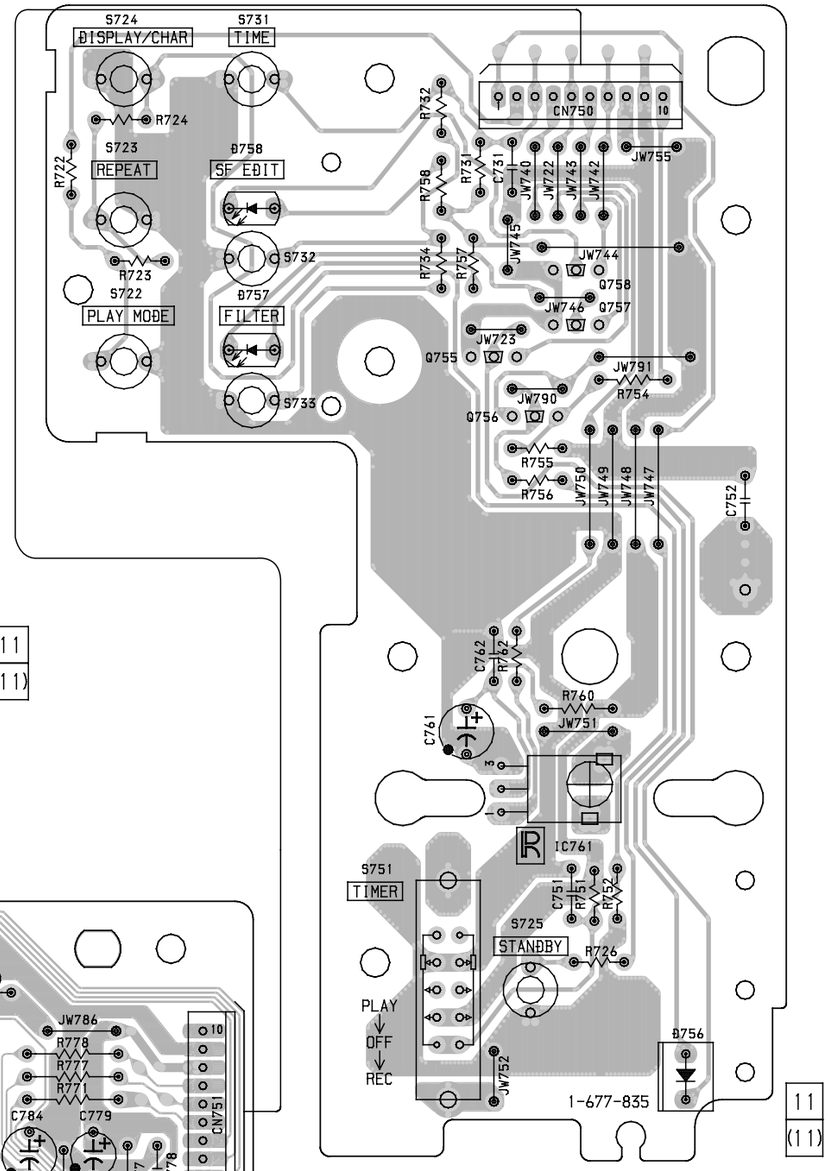
• See page 33 for Circuit Board Location.

There are few cases that the part printed on this diagram isn't mounted in this model.

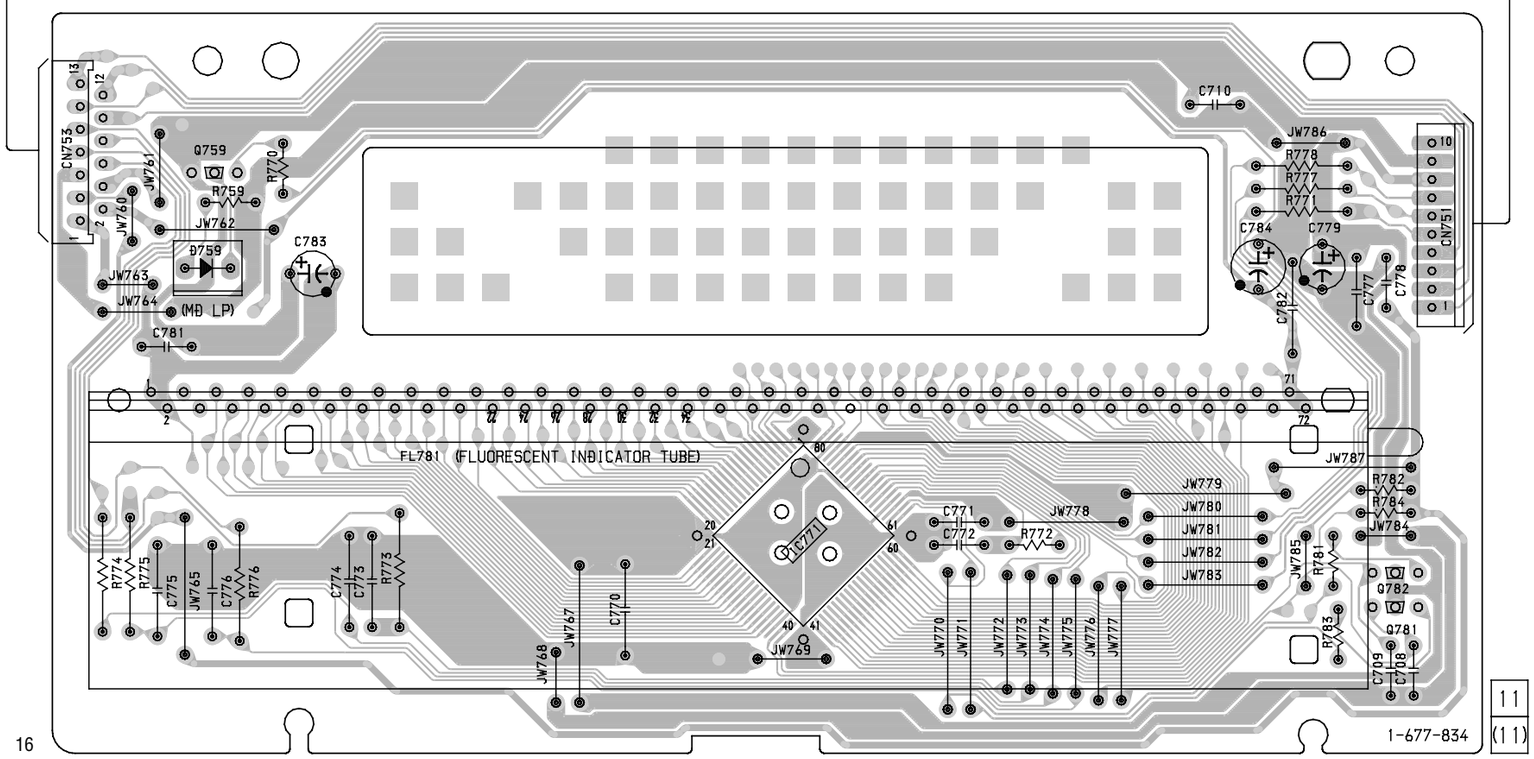
【SW BOARD】



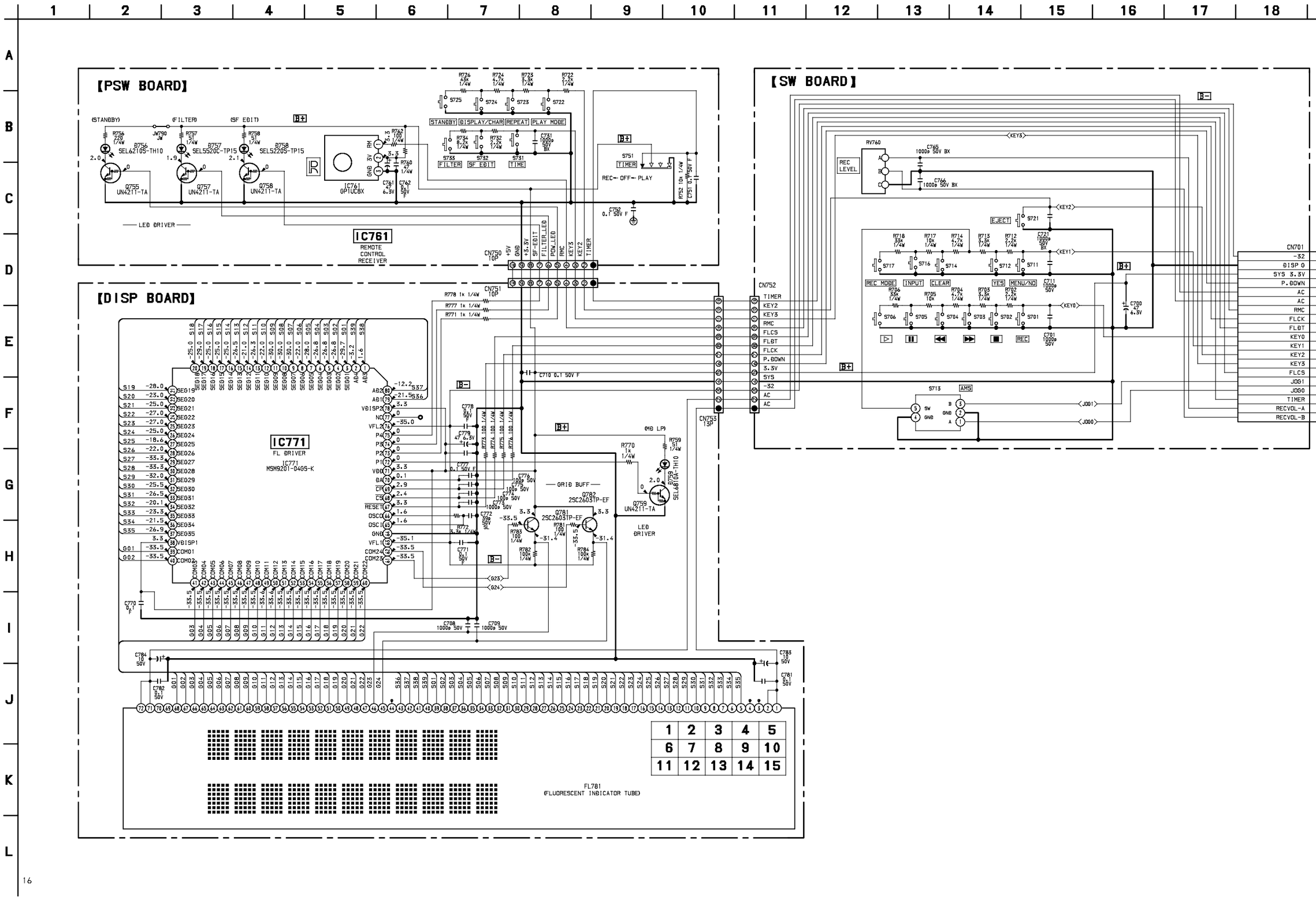
【PSW BOARD】



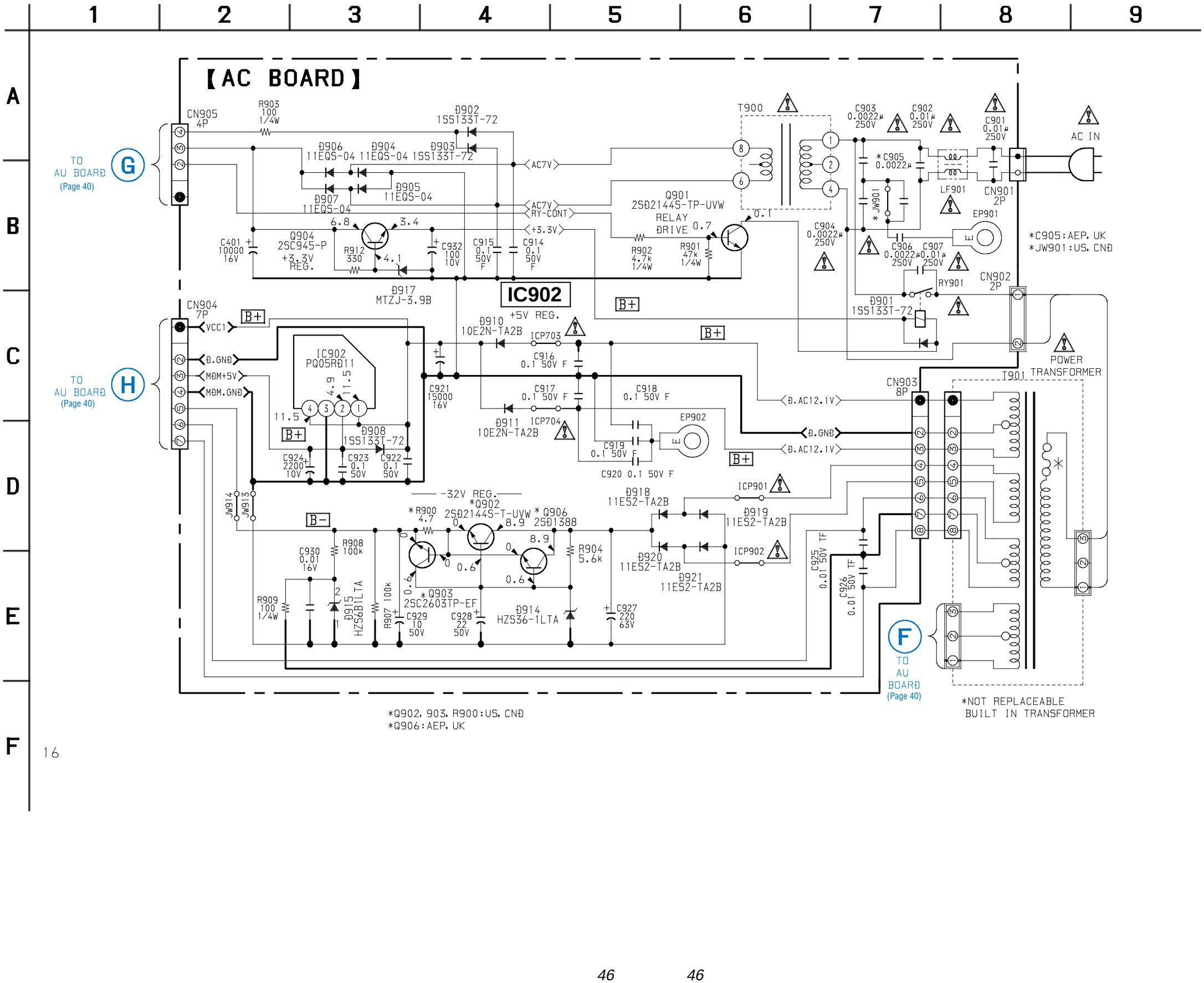
【DISP BOARD】



6-17. SCHEMATIC DIAGRAM PANEL Section



6-18. SCHEMATIC DIAGRAM AC Board

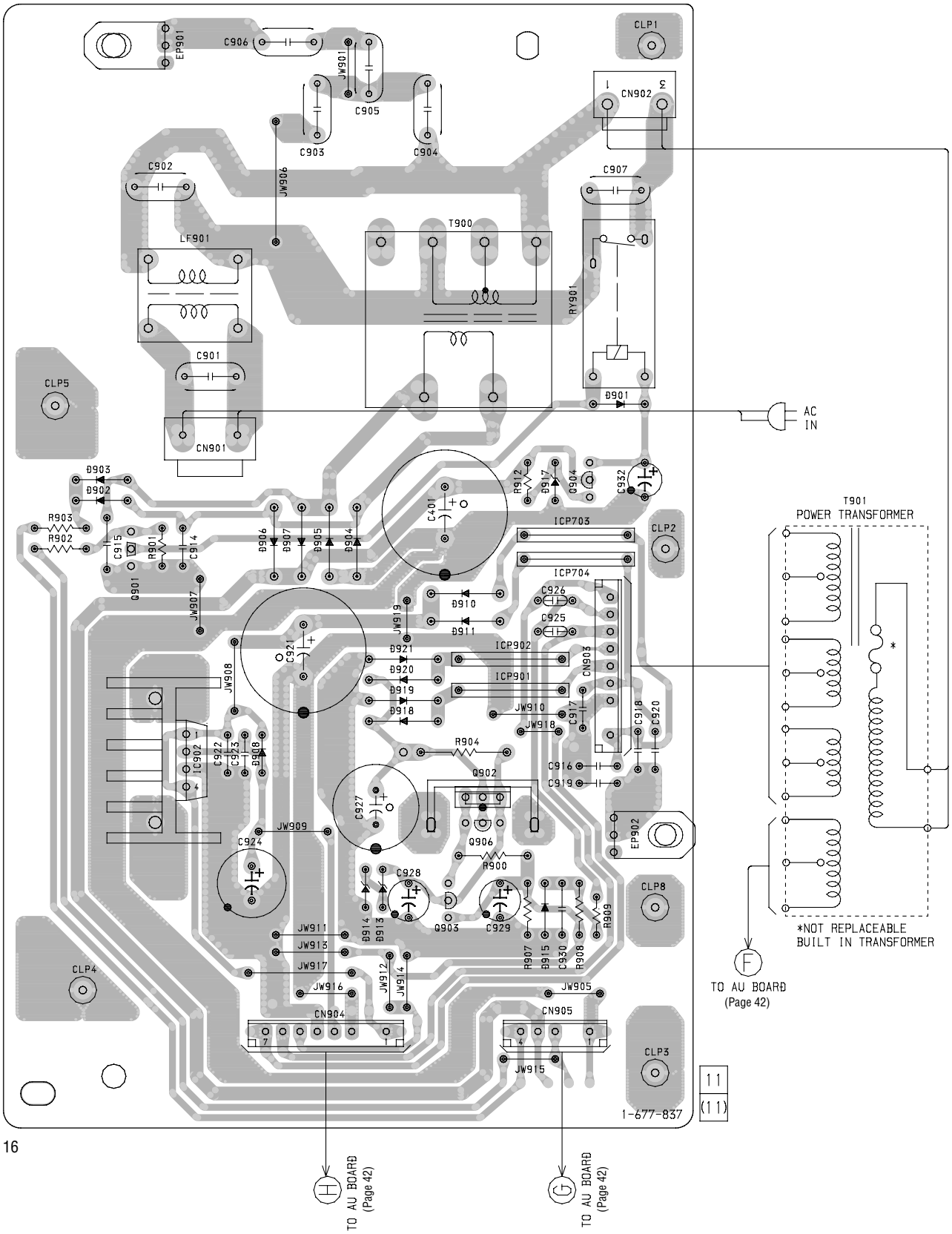


6-19. PRINTED WIRING BOARD AC Board

• See page 33 for Circuit Board Location.

There are few cases that the part printed on this diagram isn't mounted in this model.

【 AC BOARD 】



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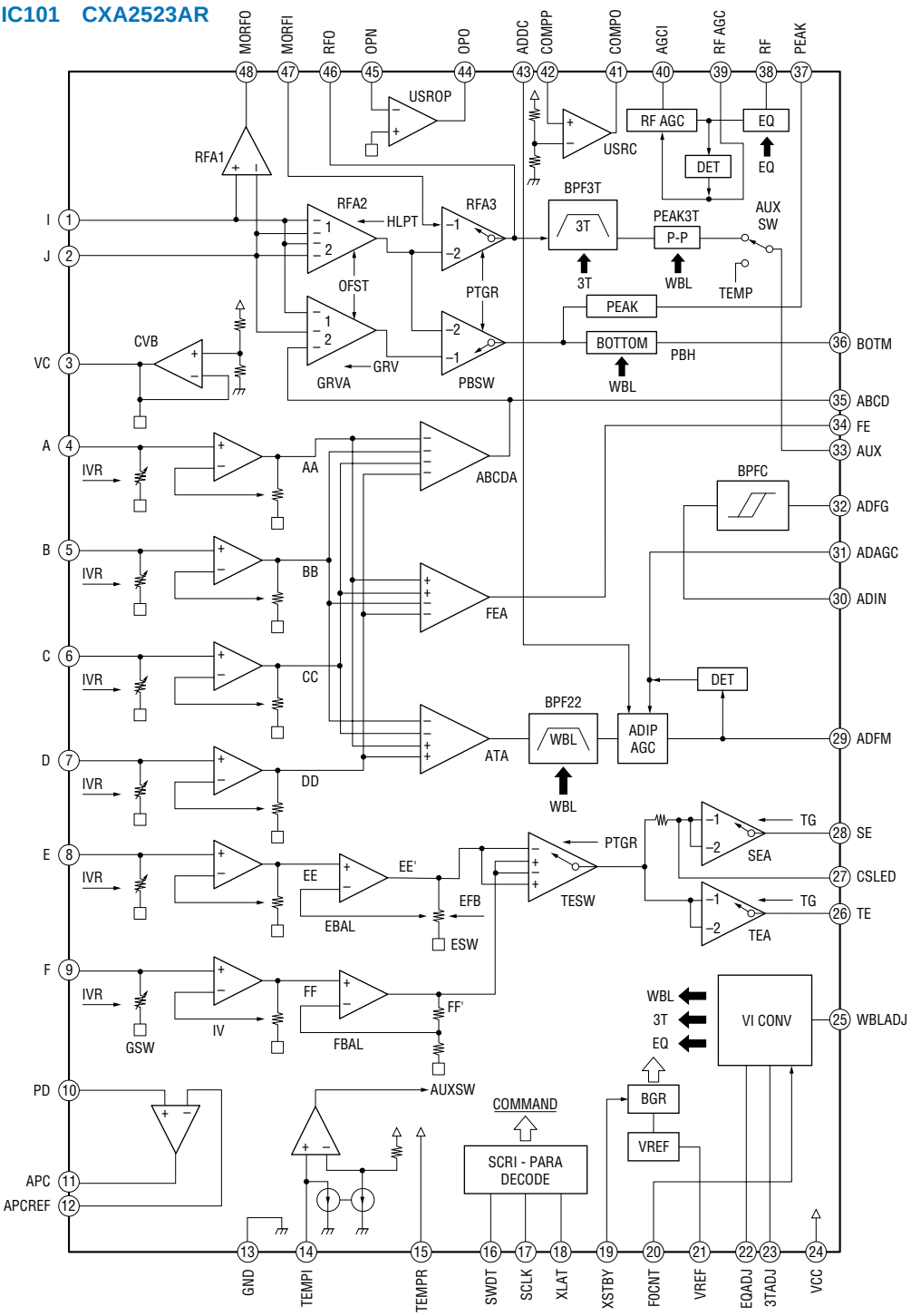
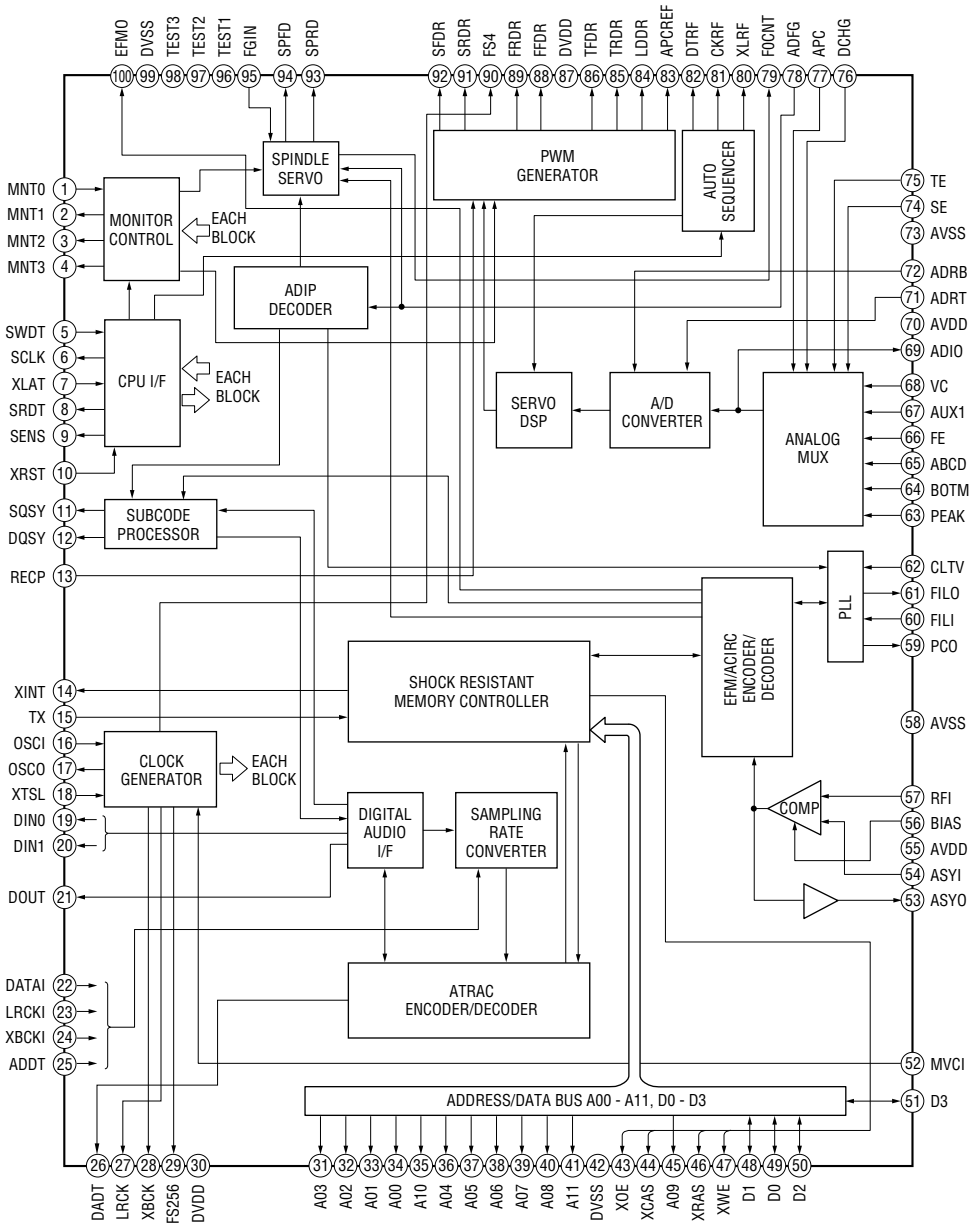
6-20. IC BLOCK DIAGRAMS

– BD Board –

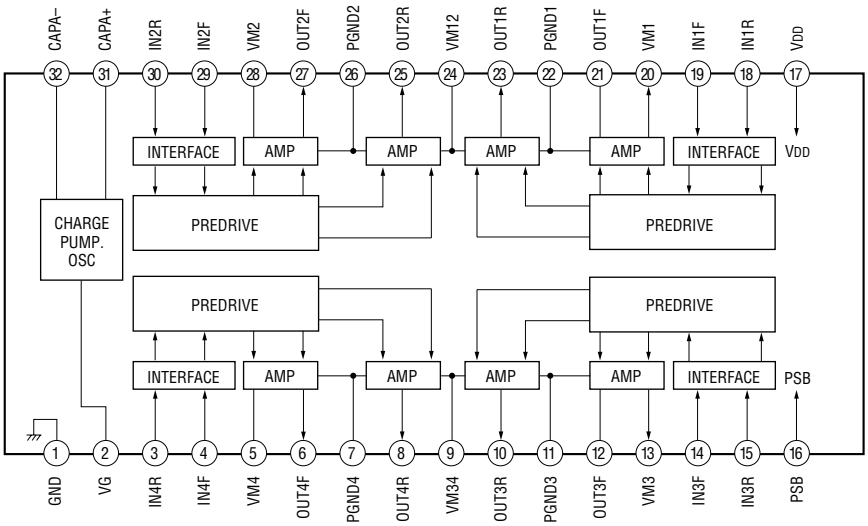
IC101 CXA2523AR



IC151 CXD2662R

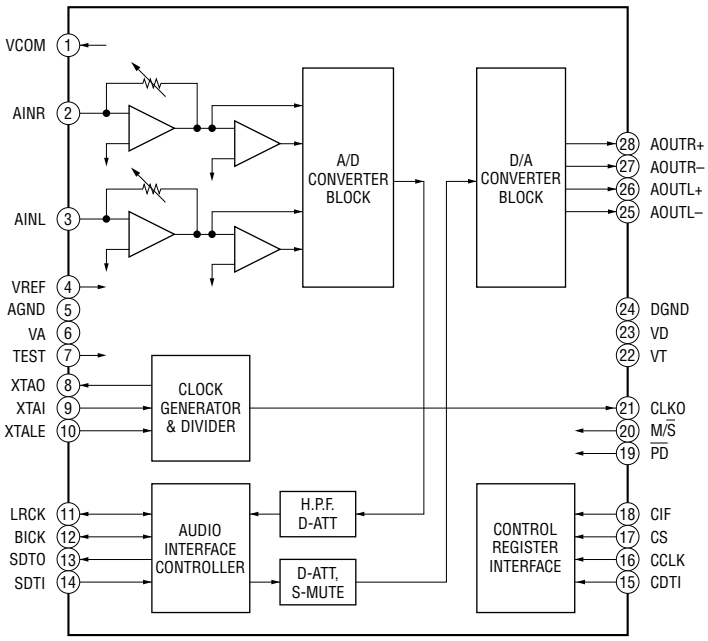


IC141 BH6511FS-E2

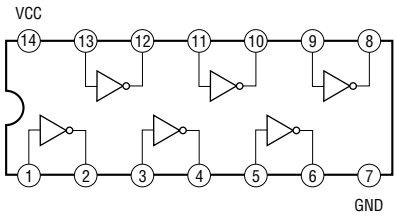


– AU Board –

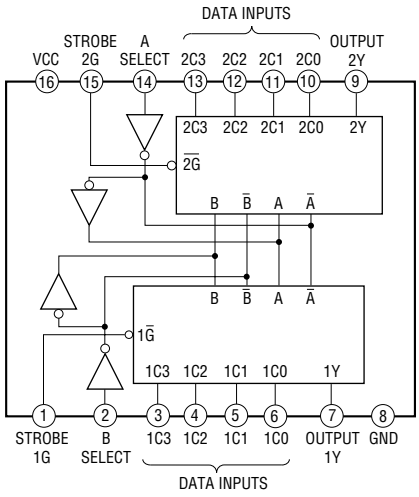
IC603 AK4524-TP



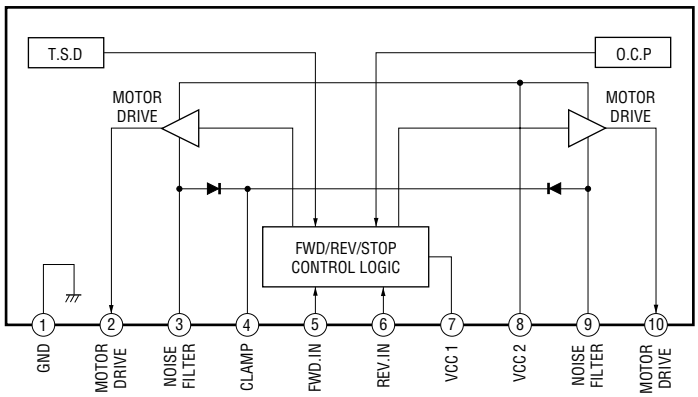
IC301 SN74HCU04ANSR



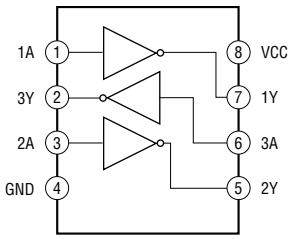
IC300 SN74HC153ANSR



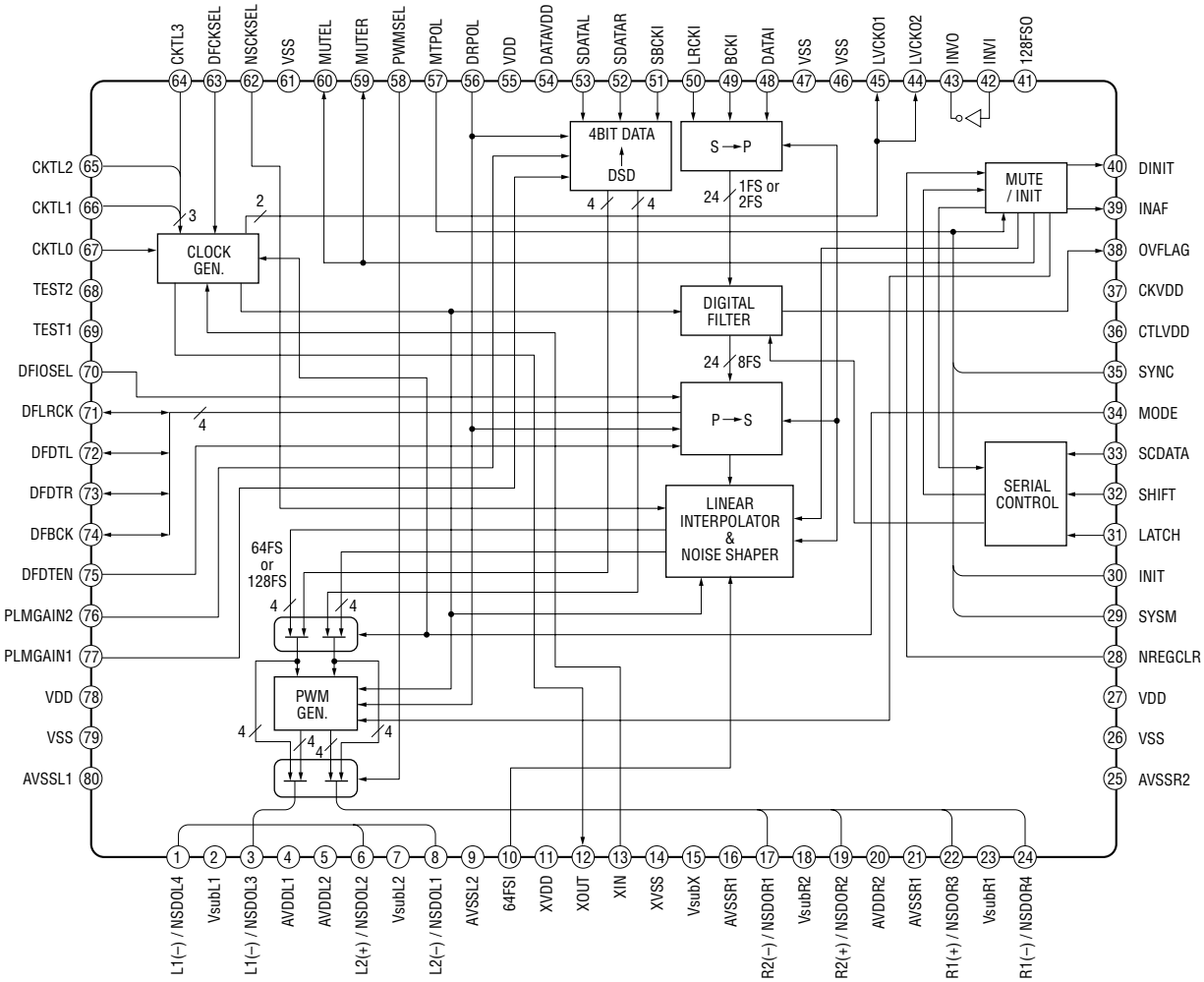
IC451 LB1641



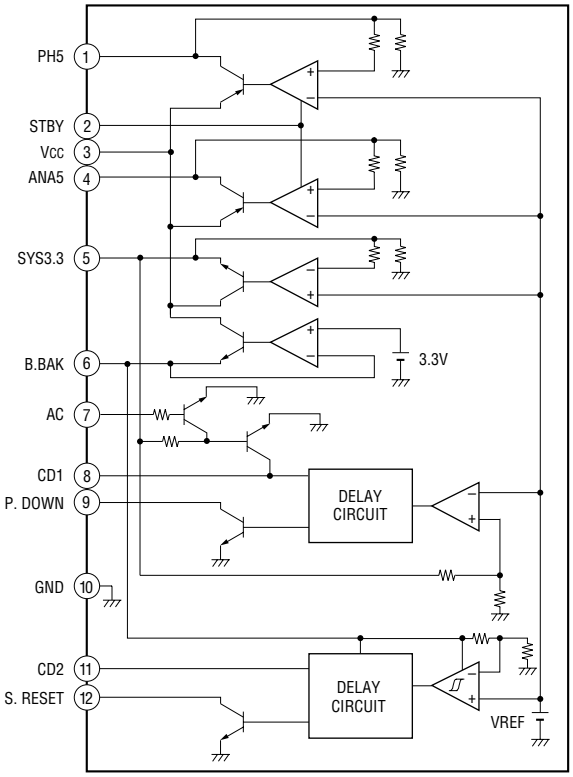
IC305 TC7WU04F-TE12L



IC201 CXD9556AQ

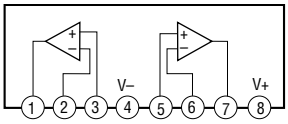


IC400 LA5643



– HP Board –

IC802 M5218AL



6-21. IC PIN FUNCTION DESCRIPTION

• **BD BOARD IC101 CXA2523AR (RF AMP, FOCUS/TRACKING ERROR AMP)**

Pin No.	Pin Name	I/O	Description
1	I	I	I-V converted RF signal I input from the optical pick-up block detector
2	J	I	I-V converted RF signal J input from the optical pick-up block detector
3	VC	O	Middle point voltage (+1.65V) generation output terminal
4 to 9	A to F	I	Signal input from the optical pick-up detector
10	PD	I	Light amount monitor input from the optical pick-up block laser diode
11	APC	O	Laser amplifier output terminal to the automatic power control circuit
12	APCREF	I	Reference voltage input terminal for setting laser power
13	GND	—	Ground terminal
14	TEMPI	I	Connected to the temperature sensor
15	TEMPR	O	Output terminal for a temperature sensor reference voltage
16	SWDT	I	Writing serial data input from the CXD2656R (IC121)
17	SCLK	I	Serial data transfer clock signal input from the CXD2656R (IC121)
18	XLAT	I	Serial data latch pulse signal input from the CXD2656R (IC121)
19	$\overline{\text{XSTBY}}$	I	Standby signal input terminal "L": standby (fixed at "H" in this set)
20	F0CNT	I	Center frequency control voltage input terminal of internal circuit (BPF22, BPF3T, EQ) input from the CXD2656R (IC121)
21	VREF	O	Reference voltage output terminal Not used (open)
22	EQADJ	I	Center frequency setting terminal for the internal circuit (EQ)
23	3TADJ	I	Center frequency setting terminal for the internal circuit (BPF3T)
24	VCC	—	Power supply terminal (+3.3V)
25	WBLADJ	I	Center frequency setting terminal for the internal circuit (BPF22)
26	TE	O	Tracking error signal output to the CXD2656R (IC121)
27	CSLED	I	Connected to the external capacitor for low-pass filter of the sled error signal
28	SE	O	Sled error signal output to the CXD2656R (IC121)
29	ADFM	O	FM signal output of the ADIP
30	ADIN	I	Receives a ADIP FM signal in AC coupling
31	ADAGC	I	Connected to the external capacitor for ADIP AGC
32	ADFG	O	ADIP duplex signal (22.05 kHz ± 1 kHz) output to the CXD2656R (IC121)
33	AUX	O	Auxiliary signal (I_3 signal/temperature signal) output to the CXD2656R (IC121)
34	FE	O	Focus error signal output to the CXD2656R (IC121)
35	ABCD	O	Light amount signal (ABCD) output to the CXD2656R (IC121)
36	BOTM	O	Light amount signal (RF/ABCD) bottom hold output to the CXD2656R (IC121)
37	PEAK	O	Light amount signal (RF/ABCD) peak hold output to the CXD2656R (IC121)
38	RF	O	Playback EFM RF signal output to the CXD2656R (IC121)
39	RFAGC	I	Connected to the external capacitor for RF auto gain control circuit
40	AGCI	I	Receives a RF signal in AC coupling
41	COMPO	O	User comparator output terminal Not used (open)
42	COMPP	I	User comparator input terminal Not used (fixed at "L")
43	ADDC	I	Connected to the external capacitor for cutting the low band of the ADIP amplifier
44	OPO	O	User operational amplifier output terminal Not used (open)
45	OPN	I	User operational amplifier inversion input terminal Not used (fixed at "L")
46	RFO	O	RF signal output terminal
47	MORFI	I	Receives a MO RF signal in AC coupling
48	MORFO	O	MO RF signal output terminal

BD BOARD IC151 CXD2656R

(DIGITAL SIGNAL PROCESSOR, DIGITAL SERVO PROCESSOR, EFM/ACIRC ENCODER/DECODER, SHOCK PROOF MEMORY CONTROLLER, ATRAC ENCODER/DECODER)

Pin No.	Pin Name	I/O	Description
1	MNT0 (FOK)	O	Focus OK signal output to the system controller (IC800) "H" is output when focus is on ("L": NG)
2	MNT1 (SHOCK)	O	Track jump detection signal output to the system controller (IC800)
3	MNT2 (XBUSY)	O	Busy monitor signal output to the system controller (IC800)
4	MNT3 (SLOCK)	O	Spindle servo lock status monitor signal output to the system controller (IC800)
5	SWDT	I	Writing serial data signal input from the system controller (IC800)
6	SCLK	I (S)	Serial data transfer clock signal input from the system controller (IC800)
7	XLAT	I (S)	Serial data latch pulse signal input from the system controller (IC800)
8	SRDT	O (3)	Reading serial data signal output to the system controller (IC800)
9	SENS	O (3)	Internal status (SENSE) output to the system controller (IC800)
10	XRST	I (S)	Reset signal input from the system controller (IC800) "L": reset
11	SQSY	O	Subcode Q sync (SCOR) output to the system controller (IC800) "L" is output every 13.3 msec Almost all, "H" is output
12	DQSY	O	Digital In U-bit CD format subcode Q sync (SCOR) output to the system controller (IC800) "L" is output every 13.3 msec Almost all, "H" is output
13	RECP	I	Laser power selection signal input from the system controller (IC800) "L": playback mode, "H": recording mode
14	XINT	O	Interrupt status output to the system controller (IC800)
15	TX	I	Recording data output enable signal input from the system controller (IC800) Writing data transmission timing input (Also serves as the magnetic head on/off output)
16	OSCI	I	System clock signal (45.158 MHz) input terminal
17	OSCO	O	System clock signal (512Fs=22.5792 MHz) output terminal Not used (open)
18	XTSL	I	Input terminal for the system clock frequency setting "L": 45.1584 MHz, "H": 22.5792 MHz (fixed at "H" in this set)
19	DIN0	I	Digital audio signal input terminal when recording mode (for digital optical input or digital coaxial input)
20	DIN1	I	Digital audio signal input terminal when recording mode Not used (fixed at "L")
21	DOUT	O	Digital audio signal output terminal when playback mode (for digital optical output or digital coaxial output)
22	DATAI	I	Serial data input terminal Not used (fixed at "L")
23	LRCKI	I	L/R sampling clock signal (44.1 kHz) input terminal Not used (fixed at "L")
24	XBCKI	I	Bit clock signal (2.8224 MHz) input terminal Not used (fixed at "L")
25	ADDT	I	Recording data input from the A/D converter (IC100)
26	DADT	O	Playback data output to the D/A converter (IC200)
27	LRCK	O	L/R sampling clock signal (44.1 kHz) output to the A/D converter (IC100) and D/A converter (IC200)
28	XBCK	O	Bit clock signal (2.8224 MHz) output to the A/D converter (IC100) and D/A converter (IC200)
29	FS256	O	Clock signal (11.2896 MHz) output terminal Not used (open)
30	DVDD	—	Power supply terminal (+3.3V) (digital system)
31 to 34	A03 to A00	O	Address signal output to the D-RAM (IC124)
35	A10	O	Address signal output to the external D-RAM Not used (open)
36 to 40	A04 to A08	O	Address signal output to the D-RAM (IC124)
41	A11	O	Address signal output to the external D-RAM Not used (open)
42	DVSS	—	Ground terminal (digital system)
43	XOE	O	Output enable signal output to the D-RAM (IC124) "L" active

* I (S) stands for schmitt input, I (A) for analog input, O (3) for 3-state output, and O (A) for analog output in the column I/O.

Pin No.	Pin Name	I/O	Description
44	$\overline{\text{XCAS}}$	O	Column address strobe signal output to the D-RAM (IC124) "L" active
45	A09	O	Address signal output to the D-RAM (IC124)
46	$\overline{\text{XRAS}}$	O	Row address strobe signal output to the D-RAM (IC124) "L" active
47	$\overline{\text{XWE}}$	O	Write enable signal output to the D-RAM (IC124) "L" active
48	D1	I/O	Two-way data bus with the D-RAM (IC124)
49	D0	I/O	
50	D2	I/O	
51	D3	I/O	
52	MVCI	I (S)	Digital in PLL oscillation input from the external VCO Not used (fixed at "L")
53	ASYO	O	Playback EFM full-swing output terminal
54	ASYI	I (A)	Playback EFM asymmetry comparator voltage input terminal
55	AVDD	—	Power supply terminal (+3.3V) (analog system)
56	BIAS	I (A)	Playback EFM asymmetry circuit constant current input terminal
57	RFI	I (A)	Playback EFM RF signal input from the CXA2523AR (IC101)
58	AVSS	—	Ground terminal (analog system)
59	PCO	O (3)	Phase comparison output for master clock of the recording/playback EFM master PLL
60	FILI	I (A)	Filter input for master clock of the recording/playback master PLL
61	FILO	O (A)	Filter output for master clock of the recording/playback master PLL
62	CLTV	I (A)	Internal VCO control voltage input of the recording/playback master PLL
63	PEAK	I (A)	Light amount signal (RF/ABCD) peak hold input from the CXA2523AR (IC101)
64	BOTM	I (A)	Light amount signal (RF/ABCD) bottom hold input from the CXA2523AR (IC101)
65	ABCD	I (A)	Light amount signal (ABCD) input from the CXA2523AR (IC101)
66	FE	I (A)	Focus error signal input from the CXA2523AR (IC101)
67	AUX1	I (A)	Auxiliary signal (I_3 signal/temperature signal) input from the CXA2523AR (IC101)
68	VC	I (A)	Middle point voltage (+1.65V) input from the CXA2523AR (IC101)
69	ADIO	O (A)	Monitor output of the A/D converter input signal Not used (open)
70	AVDD	—	Power supply terminal (+3.3V) (analog system)
71	ADRT	I (A)	A/D converter operational range upper limit voltage input terminal (fixed at "H" in this set)
72	ADRB	I (A)	A/D converter operational range lower limit voltage input terminal (fixed at "L" in this set)
73	AVSS	—	Ground terminal (analog system)
74	SE	I (A)	Sled error signal input from the CXA2523AR (IC101)
75	TE	I (A)	Tracking error signal input from the CXA2523AR (IC101)
76	DCHG	I (A)	Connected to the +3.3V power supply
77	APC	I (A)	Error signal input for the laser automatic power control Not used (fixed at "H")
78	ADFG	I (S)	ADIP duplex FM signal (22.05 kHz ± 1 kHz) input from the CXA2523AR (IC101)
79	F0CNT	O	Filter f0 control signal output to the CXA2523AR (IC101)
80	XLRF	O	Serial data latch pulse signal output to the CXA2523AR (IC101)
81	CKRF	O	Serial data transfer clock signal output to the CXA2523AR (IC101)
82	DTRF	O	Writing serial data output to the CXA2523AR (IC101)
83	APCREF	O	Control signal output to the reference voltage generator circuit for the laser automatic power control
84	LDDR	O	PWM signal output for the laser automatic power control Not used (open)
85	TRDR	O	Tracking servo drive PWM signal (–) output to the BH6511FS (IC152)
86	TFDR	O	Tracking servo drive PWM signal (+) output to the BH6511FS (IC152)
87	DVDD	—	Power supply terminal (+3.3V) (digital system)
88	FFDR	O	Focus servo drive PWM signal (+) output to the BH6511FS (IC152)

* I (S) stands for schmitt input, I (A) for analog input, O (3) for 3-state output, and O (A) for analog output in the column I/O.

Pin No.	Pin Name	I/O	Description
89	FRDR	O	Focus servo drive PWM signal (–) output to the BH6511FS (IC152)
90	FS4	O	Clock signal (176.4 kHz) output terminal (X'tal system) Not used (open)
91	SRDR	O	Sled servo drive PWM signal (–) output to the BH6511FS (IC152)
92	SFDR	O	Sled servo drive PWM signal (+) output to the BH6511FS (IC152)
93	SPRD	O	Spindle servo drive PWM signal (–) output to the BH6511FS (IC152)
94	SPFD	O	Spindle servo drive PWM signal (+) output to the BH6511FS (IC152)
95	FGIN	I (S)	Input terminal for the test (fixed at "L")
96	TEST1	I	
97	TEST2	I	
98	TEST3	I	
99	DVSS	—	Ground terminal (digital system)
100	EFMO	O	EFM signal output terminal when recording mode

* I (S) stands for schmitt input, I (A) for analog input, O (3) for 3-state output, and O (A) for analog output in the column I/O.

AU BOARD IC1 M30805SGP (SYSTEM CONTROL)

Pin No.	Pin Name	I/O	Description
1	FL-DATA	O	Display tube, serial data (TxD4) for display by microprocessor
2	FL-CLK	O	Display tube, serial clock (CLC4) for display by microprocessor
3	A1-IN	I	Control A1 input
4	RMC	I	Remote control data input
5	NC	O	Not used
6	FL-REQ	O	Not used
7	FL-BUSY	O	Not used
8	MUTE	O	LINE mute output
9	RESET(AD/DA)	O	AD/DA reset output
10	LATCH(AD/DA)	O	AD/DA latch output
11	LD-LOW	O	Loading motor voltage control output
12	LD-IN	O	Loading control output
13	LD-OUT	O	Loading control output
14	MOD	O	RF signal superimpose ON/OFF
15	BYTE	I	Data bus selection. Fixed to Low (16-bit width)
16	CNVSS	I	Processor mode selection. Fixed to Vcc
17	X-CIN	—	Sub clock output (32.768KHz)
18	X-COUT	—	Sub clock output (32.768KHz)
19	RESET	I	System reset
20	X-OUT	O	Main clock output (10 MHz)
21	VSS	I	Power supply ground
22	XIN	I	Main clock input (10 MHz)
23	VCC	I	3.3 V power supply
24	NMI	I	(Fixed to High)
25	DQSY	I	Digital-in sync (DSP)*REC system
26	P-DOWN	I	Power down detection (Low: Power Down)
27	SQSY	I	SUBQ (pit)/ADIP (MO) SYNC*PLAY system
28	KEYBD-CLK	I	Keyboard clock input
29	LDON	O	Laser ON/OFF
30	LIMIT-IN	I	Innermost circumference detection by sled
31	A1-OUT	O	Control A1 output
32	XINT	I	XINT (DSP)
33	BUSY	O	Not used
34	XELT	I	XELT (DSP)
35	WRPWR	O	Write power ON/OFF
36	I2CCLK	I/O	I2 communication clock (open-drain)
37	I2CDAT	I/O	I2 communication clock (open-drain)
38	SWDT	O	DSP (AD/DA) serial output
39	VCC	I	3.3 V power supply
40	SRDT	I	DSP serial input
41	VSS	I	Power supply ground
42	SCLK	O	DSP/(AD/DA) serial clock
43	REC-SW	I	Loading position detection
44	TX0(CLIP)	O	CLIP serial output
45	RX0(CLIP)	I	CLIP serial input
46	CLK(CLIP)	O	CLIP serial clock
47	DIG-RST	O	Digital board reset (MDM)
48	SENS	I	SENS terminal
49	PLAY-SW	I	Loading position detection
50	XLATCH	O	DSP latch
51	OUT-SW	I	Loading position detection

Pin No.	Pin Name	I/O	Description
52	RDY	I	Not used (fixed to High)
53	ALE	O	Microprocessor mode
54	HOLD	I	Not used (fixed to High)
55	HLDA	O	Microprocessor mode
56	MNT2(XBUSY)	I	(DSP)
57	VSS	I	Power supply ground
58	MNT1(SHCK)	I	(DSP)
59	VCC	I	3.3 V power supply
60	EEP-WP	O	EEP-ROM write protect
61	SDA(EEP)	I/O	EEP data
62	BCLK	O	Not used
63	OE	O	Read signal output
64	BHE	O	Not used
65	WE	O	Write signal output
66	SCL(EEP)	O	EEP CLK
67	REFRECT-SW	I	Disc reflection index detection switch
68	PROTECT-SW	I	Protect switch
69	CS0(FLASH)	O	Chip select (Flash ROM)
70	CS1(SRAM)	O	Not used
71	CS2 (Dictionary ROM)	O	Not used
72	A20	O	Address bus
73	A19	O	Address bus
74	VCC	I	3.3 V power supply
75	A18	O	Address bus
76	VSS	I	Power supply ground
77 to 85	A17 to 9	O	Address bus
86 to 89	SEL3 to 0	I	Model identification
90	WP(FLASH)	O	Flash ROM write-protect
91	VCC	I	3.3 V power supply
92	A8	O	Address bus
93	VSS	I	Power supply ground
94 to 101	A7 to A0	O	Address bus
102 to 113	D15 to D4	I/O	Data bus
114	KEYBD-CLK-CTRL	O	Keyboard clock ON/OFF
115	I2CBUSY	O	Not used
116	KEYBD-DAT	I	Keyboard data
117	REC-VOL-B	I	REC VOL (B)
118	REC-VOL-A	I	REC VOL (A)
119 to 122	D3 to D0	I/O	Data bus
123	JOG-0	I	JOG (0)
124	JOG-1	I	JOG (1)
125	LATCH(DA)	O	DA latch
126	OPT1/OPT2	O	OPT1/OPT2 selection
127	COAX/OPT	O	OPT1/OPT2 selection
128	FL-CS	O	Chip select for display
129	POWER(IIC)	O	Not used
130	VSS	I	Power supply ground
131	STB	O	DSP driver power control output
132	VCC	I	3.3 V power supply
133	OP-LEVEL	I	OP voltage (current) detection
134	NC	I	Not used
135	NC	I	Not used

Pin No.	Pin Name	I/O	Description
136	TIMER	I	Timer mode selection (slide switch)
137 to 139	KEY3 to 1	I	Key input
140	AVSS	I	Power supply ground
141	KEY0	I	Key input
142	VREF	I	3.3 V power supply
143	AVCC	I	3.3 V power supply
144	FL-DATA(IN)	O	Not used

SECTION 7
EXPLODED VIEWS

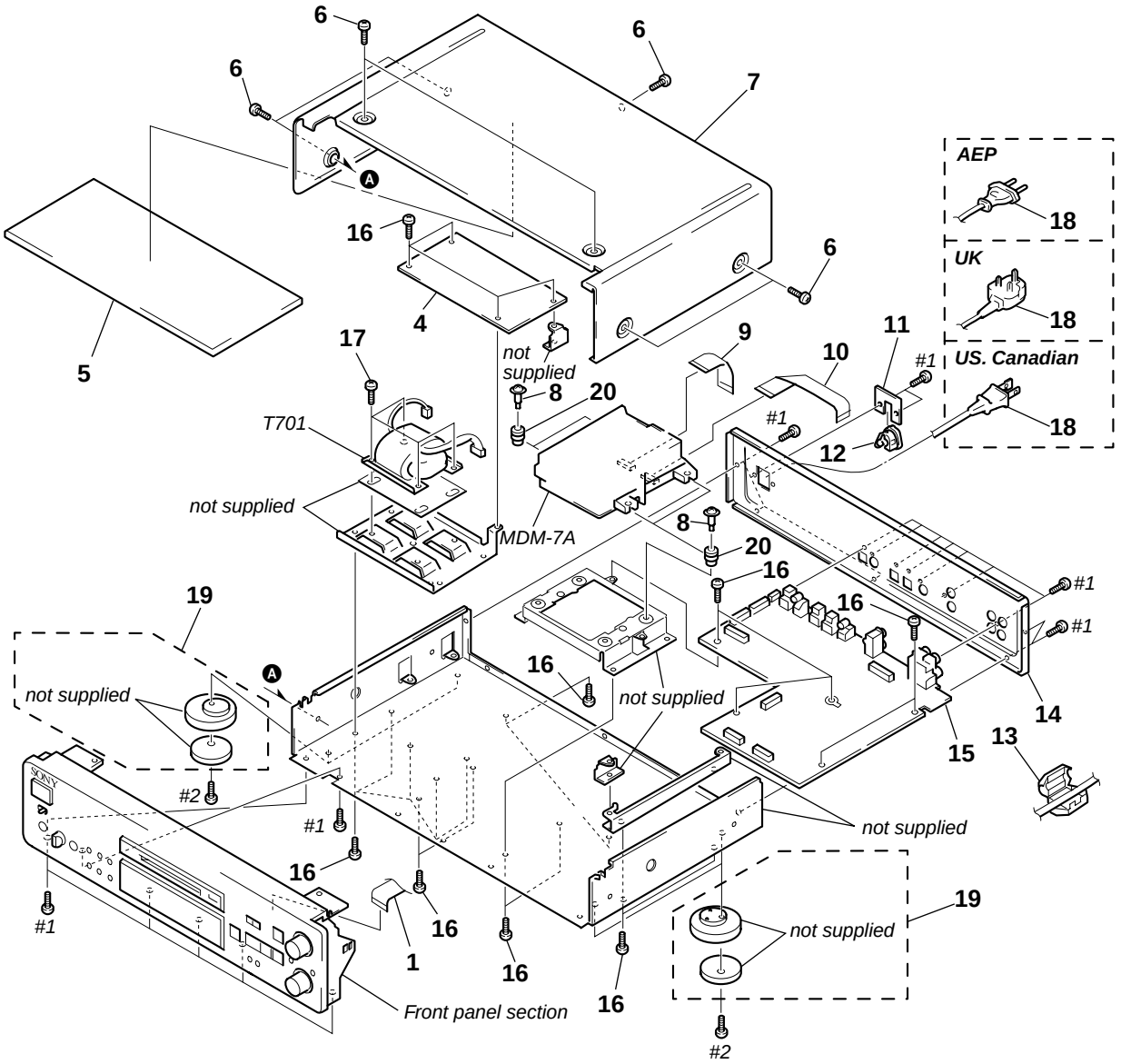
NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ Parts of Color ↑ Cabinet's Color
- Abbreviation
  CND: Canadian model

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

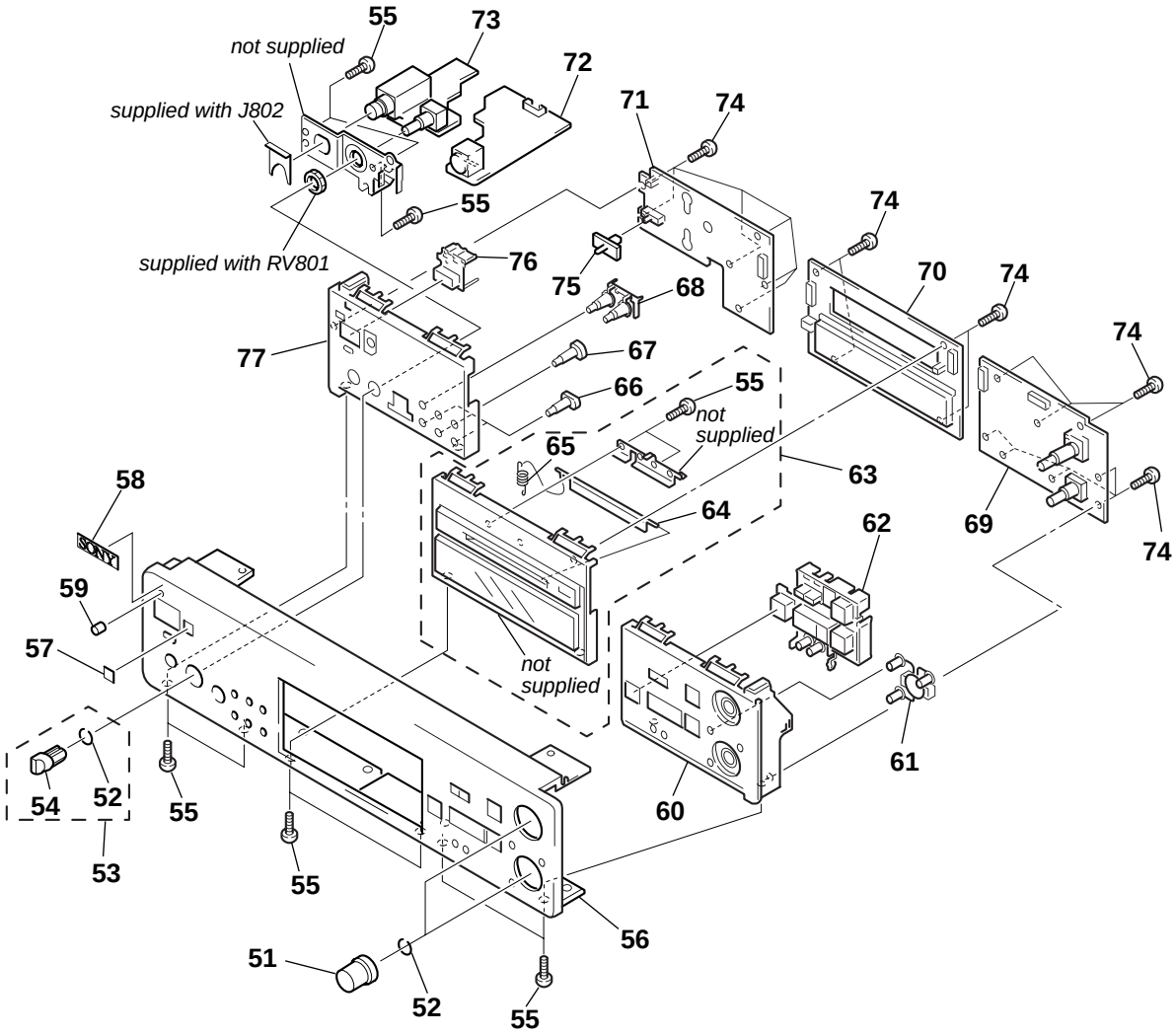
7-1. CHASSIS SECTION



Ref. No.	Part No.	Description	Remarks
1	1-792-926-11	WIRE(FLAT TYPE) (19 CORE)	
4	A-4725-113-A	AC BOARD,COMPLETE (AEP,UK)	
4	A-4725-120-A	AC BOARD,COMPLETE (US,CND)	
5	4-218-995-01	REINFORCEMENT (CASE)(UK)	
6	4-227-843-01	SCREW(TP), FLAT HEAD (BLACK)(US,CND,AEP)	
6	4-227-843-11	SCREW(TP), FLAT HEAD (SILVER)(AEP)	
6	4-227-843-21	SCREW(TP), FLAT HEAD (BLACK)(UK)	
* 7	4-997-138-02	CASE(4095269) (BLACK)	
* 7	4-997-138-42	CASE(4095269) (SILVER)	
8	4-228-643-01	SCREW(+BVTTWH M3), STEP	
9	1-792-925-11	WIRE(FLAT TYPE) (23 CORE)	
10	1-792-810-11	WIRE(FLAT TYPE) (27 CORE)	
* 11	4-923-873-01	BRACKET, CORD STOPPER	
12	3-703-244-00	BUSHING (2104), CORD	
13	1-469-241-11	CORE, FERRITE (RFC-8BK)(US,CND)	

Ref. No.	Part No.	Description	Remarks
14	4-228-507-01	PANEL, BACK (AEP,UK)	
14	4-228-507-11	PANEL, BACK (CND)	
14	4-228-507-21	PANEL, BACK (US)	
15	A-4725-115-A	AU BOARD,COMPLETE (AEP,UK)	
15	A-4725-122-A	AU BOARD,COMPLETE (US,CND)	
16	4-951-620-01	SCREW (2.6X8), +BVTP	
17	3-703-249-01	SCREW, S TIGHT, +PTTWH 3X6	
⚠18	1-558-568-21	CORD, POWER (AEP)	
⚠18	1-696-586-11	CORD, POWER (UK)	
⚠18	1-790-154-31	CORD, POWER (US,CND)	
19	X-4949-523-1	FOOT ASSY (F50180S)	
20	4-228-689-01	INSULATOR	
⚠T701	1-435-581-11	TRANSFORMER, POWER (AEP,UK)	
⚠T701	1-435-582-11	TRANSFORMER, POWER (US,CND)	

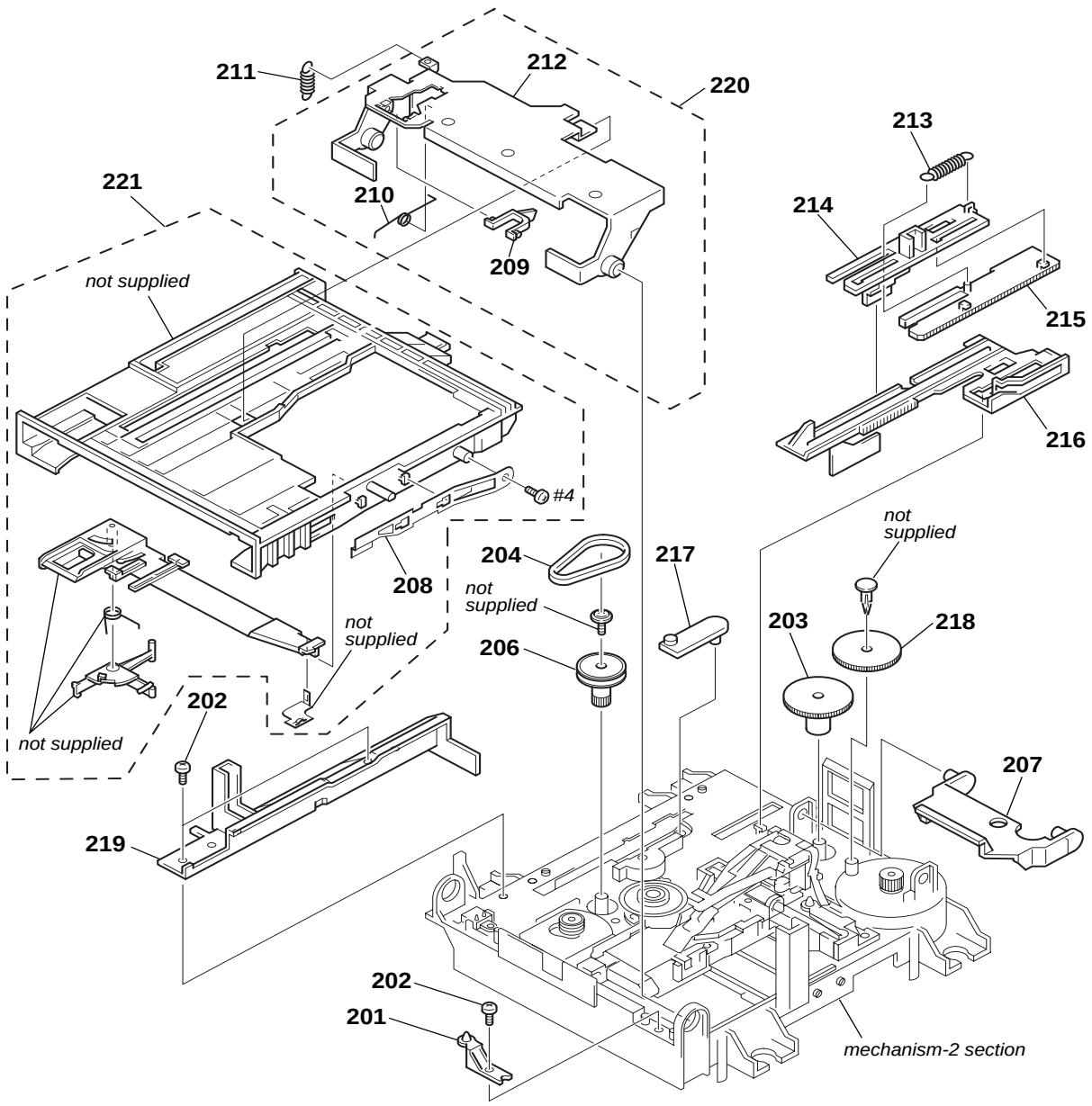
7-2. FRONT PANEL SECTION



Ref. No.	Part No.	Description	Remarks
51	4-227-834-01	KNOB(AMS) (BLACK)	
51	4-227-834-11	KNOB(AMS) (SILVER)	
52	3-354-981-01	SPRING (SUS), RING	
53	A-2003-693-A	KNOB(DIA. 10) ASSY (BLACK)	
53	A-4672-996-A	KNOB(DIA. 10) ASSY (SILVER)	
54	3-354-931-01	KNOB(DIA.10) (BLACK)	
54	3-354-931-41	KNOB(DIA.10) (SILVER)	
55	4-951-620-01	SCREW (2.6X8), +BVTP	
56	4-227-839-41	PANEL, FRONT (BLACK) (AEP,UK)	
56	4-227-839-51	PANEL, FRONT (SILVER)(AEP)	
56	4-227-839-71	PANEL, FRONT (BLACK) (US,CND)	
57	4-228-518-01	WINDOW (RM)	
58	4-942-568-41	EMBLEM (NO.5), SONY (BLACK)	
58	4-942-568-61	EMBLEM (NO.5), SONY (SILVER)	
59	4-998-607-01	INDICATOR (POWER)	
60	4-227-183-01	BASE(R), PANEL (BLACK)	
60	4-227-183-11	BASE(R), PANEL (SILVER)	
61	4-228-512-01	BUTTON (SUB) (BLACK)	
61	4-228-512-11	BUTTON (SUB) (SILVER)	
62	4-227-833-01	BUTTON (PLAY) (BLACK)	
62	4-227-833-11	BUTTON (PLAY) (SILVER)	
63	X-4952-929-1	BASE(M) ASSY, PANEL (BLACK)	

Ref. No.	Part No.	Description	Remarks
63	X-4952-930-1	BASE(M) ASSY, PANEL (SILVER)	
64	4-230-848-21	LID(MD)(SILVER)	
64	4-230-848-01	LID(MD)(BLACK)	
65	4-228-630-11	SPRING (LID), TENSION COIL	
* 66	4-615-354-01	SPACER	
67	4-228-517-01	BUTTON (EDIT) (BLACK)	
67	4-228-517-11	BUTTON (EDIT) (SILVER)	
68	X-4953-057-1	BUTTON (SF) ASSY (BLACK)	
68	X-4953-058-1	BUTTON (SF) ASSY (SILVER)	
69	A-4725-114-A	SW BOARD,COMPLETE	
70	A-4725-110-A	DISP BOARD,COMPLETE	
71	A-4725-111-A	PSW BOARD,COMPLETE	
72	1-678-501-11	KEY BOARD	
73	1-677-836-11	HP BOARD	
74	4-951-620-01	SCREW (+BVTP 2.6X8)	
75	4-971-774-01	KNOB(TIMER) (BLACK)	
75	4-971-774-31	KNOB(TIMER) (SILVER)	
76	4-228-513-01	BUTTON (POWER) (BLACK)	
76	4-228-513-11	BUTTON (POWER) (SILVER)	
77	4-227-832-01	BASE(L), PANEL (BLACK)	
77	4-227-832-11	BASE(L), PANEL (SILVER)	

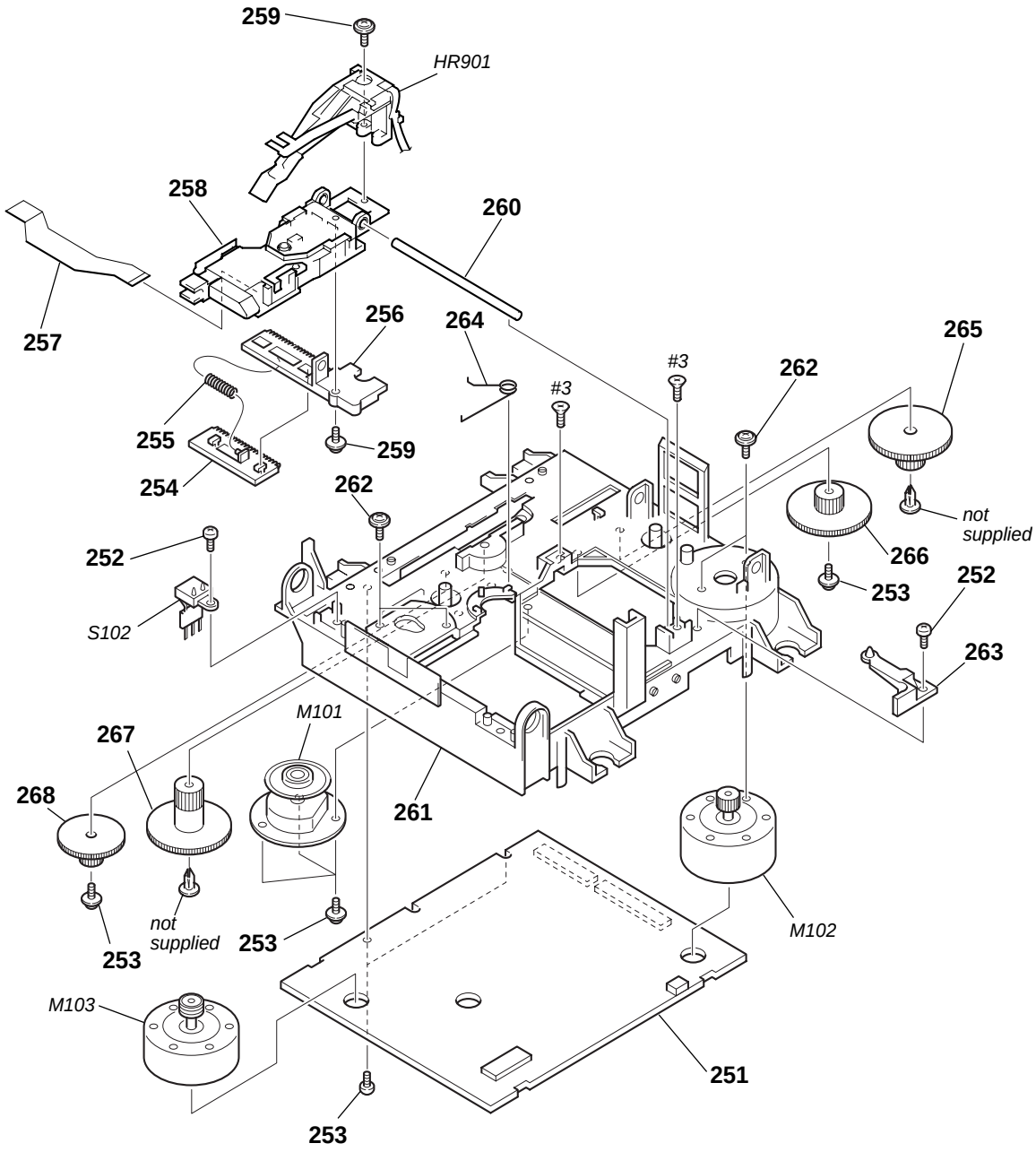
7-3. MECHANISM-1 SECTION (MDM-7A)



Ref. No.	Part No.	Description	Remarks
* 201	4-996-267-01	BASE (BU-D)	
202	4-231-319-01	SCREW (2X6) CZN, +B (P) TRI	
203	4-227-007-01	GEAR (SB)	
204	4-227-025-01	BELT (LOADING)	
205	3-372-761-01	SCREW (M1.7), TAPPING	
206	4-227-002-01	GEAR, PULLEY	
207	4-226-999-01	LEVER (HEAD)	
208	X-4952-665-1	SPRING (SHT) ASSY, LEAF	
209	4-228-923-01	LOCK (HOLDER)	
210	4-229-533-01	SPRING (STOPPER), TORSION	
211	4-227-012-01	SPRING (HOLDER), TENSION	

Ref. No.	Part No.	Description	Remarks
212	4-227-019-01	PLATE (HOLDER), RETAINER	
213	4-227-013-01	SPRING (EJ), TENSION	
214	4-226-996-01	LIMITTER (EJ)	
215	4-226-995-01	SLIDER (EJ)	
216	4-226-997-01	SLIDER	
217	4-226-998-01	LEVER (CHG)	
218	4-227-006-01	GEAR (SA)	
219	4-226-994-01	GUIDE (L)	
220	A-4680-638-B	PLATE (HOLDER) ASSY, RETAINER	
221	A-4735-075-B	HOLDER ASSY	

7-4. MECHANISM-2 SECTION (MDM-7A)



Ref. No.	Part No.	Description	Remarks
251	A-4725-054-A	BD BOARD,COMPLETE	
252	4-231-319-01	SCREW (2X6) CZN, +B (P) TRI	
253	3-372-761-01	SCREW (M1.7), TAPPING	
254	4-226-993-01	RACK	
255	4-227-014-01	SPRING (RACK), COMPRESSION	
256	4-226-992-01	BASE, SL	
257	1-678-514-11	FLEXIBLE BOARD	
⚠258	A-4672-541-A	OPTICAL PICK-UP KMS-260A	
259	4-988-560-01	SCREW (+P 1.7X6)	
260	4-996-265-01	SHAFT, MAIN	
261	4-226-989-01	CHASSIS	
262	4-232-270-01	SCREW (1.7X3.5), +PWH	
263	4-226-990-01	BASE (BU-A)	
264	4-227-023-01	SPRING (SPINDLE), TORSION	
265	4-227-008-01	GEAR (SC)	
266	4-227-009-01	GEAR (SD)	
267	4-227-005-01	GEAR (LD)	
268	4-227-004-01	GEAR (LC)	
M101	A-4735-757-A	MOTOR ASSY, SPINDLE	
M102	A-4672-900-A	MOTOR ASSY, SLED	
M103	A-4672-975-A	MOTOR ASSY, LOADING	
S102	1-771-957-11	SWITCH, PUSH (2 KEY)	
HR901	1-500-670-22	HEAD, OVER LIGHT	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

AC

SECTION 8
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... ,
  uPB... , µPB... , uPC... , µPC... ,
  uPD..., µPD...

When indicating parts by reference number, please include the board name.

- CAPACITORS:
  uF: µF
- COILS
  uH: µH
- Abbreviation
  CND: Canadian model

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remarks
	A-4725-113-A	AC BOARD, COMPLETE (AEP,UK)			
		**********			
	A-4725-120-A	AC BOARD, COMPLETE (US,CND)			
		**********			
		< CAPACITOR >			
C401	1-126-939-11	ELECT	10000uF	20.00%	16V
⚠C901	1-113-925-11	CERAMIC	0.01uF	20.00%	250V
⚠C902	1-113-925-11	CERAMIC	0.01uF	20.00%	250V
⚠C903	1-113-920-11	CERAMIC	0.0022uF	20.00%	250V
⚠C904	1-113-920-11	CERAMIC	0.0022uF	20.00%	250V
⚠C905	1-113-920-11	CERAMIC	0.0022uF	20.00%	250V (AEP,UK)
⚠C906	1-113-920-11	CERAMIC	0.0022uF	20.00%	250V
⚠C907	1-113-925-11	CERAMIC	0.01uF	20.00%	250V
C914	1-164-159-11	CERAMIC	0.1uF		50V
C915	1-164-159-11	CERAMIC	0.1uF		50V
C916	1-164-159-11	CERAMIC	0.1uF		50V
C917	1-164-159-11	CERAMIC	0.1uF		50V
C918	1-164-159-11	CERAMIC	0.1uF		50V
C919	1-164-159-11	CERAMIC	0.1uF		50V
C920	1-164-159-11	CERAMIC	0.1uF		50V
C921	1-117-850-11	ELECT	15000uF	20.00%	16V
C922	1-164-159-11	CERAMIC	0.1uF		50V
C923	1-164-159-11	CERAMIC	0.1uF		50V
C924	1-126-927-11	ELECT	2200uF	20.00%	10V
C925	1-136-153-00	FILM	0.01uF	5%	50V
C926	1-136-153-00	FILM	0.01uF	5%	50V
C927	1-128-553-11	ELECT	220uF	20.00%	63V
C928	1-126-965-11	ELECT	22uF	20.00%	50V
C929	1-126-964-11	ELECT	10uF	20.00%	50V
C930	1-162-306-11	CERAMIC	0.01uF	30.00%	16V
C932	1-104-665-11	ELECT	100uF	20.00%	10V
		< CONNECTOR >			
* CN901	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P			
CN902	1-564-321-00	PIN, CONNECTOR 2P			
CN903	1-691-770-11	PLUG (MICRO CONNECTOR) 8P			
CN904	1-691-769-11	PLUG (MICRO CONNECTOR) 7P			
CN905	1-691-766-11	PLUG (MICRO CONNECTOR) 4P			
		< DIODE >			
D901	8-719-911-19	DIODE 1SS133T-72			
D902	8-719-911-19	DIODE 1SS133T-72			
D903	8-719-911-19	DIODE 1SS133T-72			
D904	8-719-210-21	DIODE 11EQS04-TA2B			
D905	8-719-210-21	DIODE 11EQS04-TA2B			
D906	8-719-210-21	DIODE 11EQS04-TA2B			
D907	8-719-210-21	DIODE 11EQS04-TA2B			
D908	8-719-911-19	DIODE 1SS133T-72			
D910	8-719-200-77	DIODE 10E2N-TA2B			
D911	8-719-200-77	DIODE 10E2N-TA2B			
D914	8-719-936-54	DIODE HZS36-1LTA			
D915	8-719-933-36	DIODE HZS6B1LTA			
D917	8-719-983-69	DIODE MTZJ-T-72-3.9B			
D918	8-719-200-82	DIODE 11ES2-TA2B			
D919	8-719-200-82	DIODE 11ES2-TA2B			
D920	8-719-200-82	DIODE 11ES2-TA2B			
D921	8-719-200-82	DIODE 11ES2-TA2B			
		< TERMINAL >			
EP901	1-537-771-21	TERMINAL BOARD, GROUND			
EP902	1-537-771-21	TERMINAL BOARD, GROUND			
		< IC >			
IC902	8-759-471-81	IC PQ05RD11			
		< IC LINK >			
⚠ICP703	1-532-844-21	LINK, IC (AEP,UK)			
⚠ICP703	1-532-781-11	FUSE, MICRO 3.15A 125V (US,CND)			
⚠ICP704	1-532-844-21	LINK, IC (AEP,UK)			
⚠ICP704	1-532-781-11	FUSE, MICRO 3.15A 125V (US,CND)			
⚠ICP901	1-532-835-21	LINK, IC (AEP,UK)			
⚠ICP901	1-532-772-11	FUSE, MICRO (SECONDARY) (US,CND)			
⚠ICP902	1-532-835-21	LINK, IC (AEP,UK)			
⚠ICP902	1-532-772-11	FUSE, MICRO (SECONDARY) (US,CND)			
		< LINE FILTER >			
⚠LF901	1-424-485-11	FILTER, LINE			
		< TRANSISTOR >			
Q901	8-729-922-37	TRANSISTOR 2SD2144S-TP-UVW			
Q902	8-729-111-29	TRANSISTOR 2SD1388TP-34 (US,CND)			
Q903	8-729-620-05	TRANSISTOR 2SC2603TP-EF (US,CND)			
Q904	8-729-194-57	TRANSISTOR 2SC945TP-P			
Q906	8-729-111-29	TRANSISTOR 2SD1388TP-34 (AEP,UK)			
		< RESISTOR >			
R900	1-260-300-11	CARBON	4.7	5%	1/2W (US,CND)
R901	1-249-437-11	CARBON	47K	5%	1/4W
R902	1-249-425-11	CARBON	4.7K	5%	1/4W F
R903	1-247-807-31	CARBON	100	5%	1/4W
R904	1-260-108-11	CARBON	5.6K	5%	1/2W

Ref. No.	Part No.	Description			Remarks
		< RESISTOR >			
R907	1-249-441-11	CARBON	100K	5%	1/4W
R908	1-249-441-11	CARBON	100K	5%	1/4W
R909	1-247-807-31	CARBON	100	5%	1/4W
R912	1-249-411-11	CARBON	330	5%	1/4W
		< RELAY >			
⚠RY901	1-755-356-11	RELAY			
		< TRANSFORMER >			
⚠T900	1-435-584-11	TRANSFORMER, POWER (AEP,UK)			
⚠T900	1-435-585-11	TRANSFORMER, POWER (US,CND)			
**********					
	A-4725-115-A	AU BOARD, COMPLETE (AEP,UK)			
		**********			
	A-4725-122-A	AU BOARD, COMPLETE (US,CND)			
		**********			
*	4-941-237-11	HEATSINK			
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 TT(B)			
		< BATTERY >			
BT701	1-528-887-11	BATTERY, LITHIUM SECONDARY			
		< CAPACITOR >			
C1	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C2	1-126-964-11	ELECT	10uF	20.00%	50V
C17	1-163-222-11	CERAMIC CHIP	5PF	0.5%	50V
C18	1-163-224-11	CERAMIC CHIP	7PF	0.5%	50V
C19	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C27	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C36	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C37	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C48	1-163-251-11	CERAMIC CHIP	100PF	5.00%	50V
C142	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C145	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C146	1-104-665-11	ELECT	100uF	20.00%	10V
C147	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C151	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C152	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C200	1-163-243-11	CERAMIC CHIP	47PF	5.00%	50V
C201	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C202	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C203	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C204	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C205	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C206	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C207	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C208	1-124-997-11	ELECT	470uF	20.00%	6.3V
C209	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C210	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C211	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C212	1-163-251-11	CERAMIC CHIP	100PF	5.00%	50V
C213	1-163-251-11	CERAMIC CHIP	100PF	5.00%	50V
C214	1-165-319-11	CERAMIC CHIP	0.1uF		50V

Ref. No.	Part No.	Description			Remarks
C215	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C217	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C218	1-124-997-11	ELECT	470uF	20.00%	6.3V
C219	1-124-997-11	ELECT	470uF	20.00%	6.3V
C220	1-124-997-11	ELECT	470uF	20.00%	6.3V
C221	1-124-997-11	ELECT	470uF	20.00%	6.3V
C222	1-163-089-00	CERAMIC CHIP	6PF		50V
C223	1-163-089-00	CERAMIC CHIP	6PF		50V
C224	1-124-985-11	ELECT	1000uF	20.00%	6.3V
C225	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C226	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C227	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C228	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C229	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C230	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C231	1-130-475-00	MYLAR	0.0022uF	5%	50V
C232	1-130-469-00	MYLAR	680PF	5%	50V
C233	1-130-467-00	MYLAR	470PF	5%	50V
C234	1-130-467-00	MYLAR	470PF	5%	50V
C235	1-130-469-00	MYLAR	680PF	5%	50V
C236	1-110-339-11	MYLAR	220PF	5.00%	50V
C237	1-110-339-11	MYLAR	220PF	5.00%	50V
C238	1-136-818-11	FILM	0.0047uF	5.00%	100V
C239	1-130-472-00	MYLAR	0.0012uF	5%	50V
C240	1-117-914-51	ELECT	330uF	20.00%	25V
C241	1-124-995-11	ELECT	220uF	20.00%	10V
C281	1-130-475-00	MYLAR	0.0022uF	5%	50V
C282	1-130-469-00	MYLAR	680PF	5%	50V
C283	1-130-467-00	MYLAR	470PF	5%	50V
C284	1-130-467-00	MYLAR	470PF	5%	50V
C285	1-130-469-00	MYLAR	680PF	5%	50V (AEP,UK)
C286	1-110-339-11	MYLAR	220PF	5.00%	50V
C287	1-110-339-11	MYLAR	220PF	5.00%	50V
C288	1-136-818-11	FILM	0.0047uF	5.00%	100V
C289	1-130-472-00	MYLAR	0.0012uF	5%	50V
C290	1-117-914-51	ELECT	330uF	20.00%	25V
C291	1-124-995-11	ELECT	220uF	20.00%	10V
C300	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C301	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C302	1-104-665-11	ELECT	100uF	20.00%	10V
C303	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C304	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C305	1-104-665-11	ELECT	100uF	20.00%	10V
C306	1-104-665-11	ELECT	100uF	20.00%	10V
C307	1-104-665-11	ELECT	100uF	20.00%	10V
C308	1-104-665-11	ELECT	100uF	20.00%	10V
C309	1-136-165-00	MYLAR	0.1uF	5.00%	50V
C310	1-136-165-00	MYLAR	0.1uF	5.00%	50V
C311	1-136-165-00	MYLAR	0.1uF	5.00%	50V
C312	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C313	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C314	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C315	1-125-827-91	CERAMIC CHIP	1uF	10.00%	25V
C316	1-104-665-11	ELECT	100uF	20.00%	10V
C317	1-165-319-11	CERAMIC CHIP	0.1uF		50V

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

AU

Ref. No.	Part No.	Description			Remarks
C318	1-136-165-00	MYLAR	0.1uF	5.00%	50V
C319	1-163-251-11	CERAMIC CHIP	100PF	5.00%	50V
C320	1-125-827-91	CERAMIC CHIP	1uF	10.00%	25V
C321	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C322	1-125-827-91	CERAMIC CHIP	1uF	10.00%	25V
C323	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C324	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C325	1-125-827-91	CERAMIC CHIP	1uF	10.00%	25V
C402	1-104-663-11	ELECT	33uF	20.00%	25V
C403	1-126-961-11	ELECT	2.2uF	20.00%	50V
C404	1-126-925-11	ELECT	470uF	20.00%	10V
C405	1-126-925-11	ELECT	470uF	20.00%	10V
C406	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C407	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C409	1-104-665-11	ELECT	100uF	20.00%	10V
C410	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C411	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C412	1-126-963-11	ELECT	4.7uF	20.00%	50V
C414	1-104-665-11	ELECT	100uF	20.00%	10V
C415	1-136-153-00	FILM	0.01uF	5%	50V
C416	1-136-153-00	FILM	0.01uF	5%	50V
C417	1-115-877-11	ELECT(BLOCK)	4700uF	20.00%	25V
C418	1-115-877-11	ELECT(BLOCK)	4700uF	20.00%	25V
C419	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C420	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C421	1-128-489-11	ELECT	3300uF	20.00%	16V
C422	1-128-489-11	ELECT	3300uF	20.00%	16V
C423	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C424	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C425	1-104-664-11	ELECT	47uF	20.00%	25V
C426	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C451	1-104-665-11	ELECT	100uF	20.00%	25V
C452	1-163-021-91	CERAMIC CHIP	0.01uF	10.00%	50V
C453	1-163-021-91	CERAMIC CHIP	0.01uF	10.00%	50V
C454	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C601	1-110-335-11	MYLAR	100PF	5.00%	50V
C602	1-126-023-11	ELECT	100uF	20.00%	25V
C604	1-126-049-11	ELECT	22uF	20.00%	25V
C605	1-130-471-00	MYLAR	0.001uF	5%	50V
C621	1-126-022-11	ELECT	47uF	20.00%	25V
C622	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C623	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C624	1-124-995-11	ELECT	220uF	20.00%	10V
C625	1-126-022-11	ELECT	47uF	20.00%	25V
C626	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C627	1-126-049-11	ELECT	22uF	20.00%	25V
C628	1-124-995-11	ELECT	220uF	20.00%	10V
C629	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C630	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C631	1-124-994-11	ELECT	100uF	20.00%	10V
C633	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C638	1-163-231-11	CERAMIC CHIP	15PF	5.00%	50V
C641	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C642	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C645	1-163-251-11	CERAMIC CHIP	100PF	5.00%	50V

Ref. No.	Part No.	Description			Remarks
C646	1-163-251-11	CERAMIC CHIP	100PF	5.00%	50V
C647	1-163-251-11	CERAMIC CHIP	100PF	5.00%	50V
C648	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C649	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C650	1-124-995-11	ELECT	220uF	20.00%	10V
C651	1-110-335-11	MYLAR	100PF	5.00%	50V
C652	1-126-023-11	ELECT	100uF	20.00%	25V
C654	1-126-049-11	ELECT	22uF	20.00%	25V
C655	1-130-471-00	MYLAR	0.001uF	5%	50V
C681	1-124-995-11	ELECT	220uF	20.00%	10V
C682	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C1037	1-165-319-11	CERAMIC CHIP	0.1uF		50V
		< CONNECTOR >			
CN2	1-778-691-11	CONNECTOR, FFC/FPC 19P			
CN11	1-793-991-11	CONNECTOR, FFC/FPC 23P			
CN12	1-784-384-11	CONNECTOR, FFC/FPC 27P			
CN200	1-691-769-11	PLUG (MICRO CONNECTOR) 7P			
CN402	1-568-683-11	PIN, CONNECTOR (PC BAORD) 2P			
* CN404	1-564-506-11	PLUG, CONNECTOR 3P			
CN700	1-691-768-11	PLUG (MICRO CONNECTOR) 6P			
		< DIODE >			
D201	8-719-210-39	DIODE EC10QS04-TE12L5			
D202	8-719-988-61	DIODE 1SS355TE-17			
D322	8-719-988-61	DIODE 1SS355TE-17			
D401	8-719-988-61	DIODE 1SS355TE-17			
D402	8-719-210-39	DIODE EC10QS04-TE12L5			
D403	8-719-210-39	DIODE EC10QS04-TE12L5			
D404	8-719-210-33	DIODE EC10DS2TE12R			
D405	8-719-210-33	DIODE EC10DS2TE12R			
D406	8-719-210-33	DIODE EC10DS2TE12R			
D407	8-719-210-33	DIODE EC10DS2TE12R			
D408	8-719-210-39	DIODE EC10QS04-TE12L5			
D409	8-719-210-39	DIODE EC10QS04-TE12L5			
D410	8-719-988-61	DIODE 1SS355TE-17			
D411	8-719-421-18	DIODE MA8033-L-TX			
D412	8-719-820-05	DIODE 1SS181-TE85L			
D601	8-719-988-61	DIODE 1SS355TE-17			
D602	8-719-988-61	DIODE 1SS355TE-17			
D603	8-719-988-61	DIODE 1SS355TE-17			
D604	8-719-988-61	DIODE 1SS355TE-17			
D605	8-719-988-61	DIODE 1SS355TE-17			
		< TERMINAL >			
EP200	1-537-771-21	TERMINAL BOARD, GROUND			
		< FERRITE BEAD >			
FB145	1-414-235-22	INDUCTOR CHIP 0UH			
		< IC >			
IC1	8-759-677-81	IC M30805SGP			
IC2	8-759-677-80	IC TE28F800B3TA90			
IC201	8-759-678-29	IC CXD9556AQ			
IC203	8-759-471-81	IC PQ05RD11			
IC205	8-759-712-02	IC NJM2114D			

Ref. No.	Part No.	Description	Remarks
IC206	8-759-712-02	IC NJM2114D	
IC255	8-759-712-02	IC NJM2114D	
IC256	8-759-712-02	IC NJM2114D	
IC300	8-759-926-17	IC SN74HC153ANSR	
IC301	8-759-269-92	IC SN74HCU04ANSR	
IC302	8-749-012-70	IC GP1F38R (OPTICAL IN2)	
IC303	8-749-012-70	IC GP1F38R (OPTICAL IN1)	
IC304	8-749-012-69	IC GP1F38T (OPTICAL OUT)	
IC305	8-759-242-70	IC TC7WU04F-TE12L	
IC400	8-759-678-77	IC LA5643	
IC401	8-759-605-00	IC M5F78M07L	
IC402	8-759-604-95	IC M5F79M07L	
IC451	8-759-822-09	IC LB1641	
IC601	8-759-471-81	IC PQ05RD11	
IC602	8-759-712-02	IC NJM2114D	
IC603	8-759-579-68	IC AK4524-TP	
		< JACK >	
J200	1-784-430-11	JACK, PIN 4P (ANALOG)	
J300	1-784-432-11	JACK, PIN 1P (COAXIAL IN)	
J301	1-784-689-11	JACK, PIN 1P (COAXIAL OUT)	
J321	1-779-655-21	JACK (SMALL TYPE) (2 GANG)(CONTROL A1II)	
		< JUMPER RESISTOR >	
JR451	1-216-296-91	SHORT 0	
JR452	1-216-296-91	SHORT 0	
JW301	1-216-295-91	SHORT 0	
JW321	1-216-295-91	SHORT 0	
JW401	1-216-296-91	SHORT 0	
JW402	1-216-296-91	SHORT 0	
JW403	1-216-295-91	SHORT 0	
		< COIL >	
L146	1-412-056-11	INDUCTOR CHIP 4.7uH	
L201	1-412-056-11	INDUCTOR CHIP 4.7uH	
L202	1-414-235-22	INDUCTOR CHIP 0uH	
L203	1-412-056-11	INDUCTOR CHIP 4.7uH	
L204	1-412-056-11	INDUCTOR CHIP 4.7uH	
L205	1-414-235-22	INDUCTOR CHIP 0uH	
L206	1-414-235-22	INDUCTOR CHIP 0uH	
L207	1-414-235-22	INDUCTOR CHIP 0uH	
L300	1-412-056-11	INDUCTOR CHIP 4.7uH	
L301	1-412-056-11	INDUCTOR CHIP 4.7uH	
L302	1-412-056-11	INDUCTOR CHIP 4.7uH	
L303	1-412-056-11	INDUCTOR CHIP 4.7uH	
L304	1-414-235-22	INDUCTOR CHIP 0uH	
L305	1-414-235-22	INDUCTOR CHIP 0uH	
L451	1-216-295-91	SHORT 0	
L452	1-216-295-91	SHORT 0	
L453	1-216-295-91	SHORT 0	
L455	1-216-295-91	SHORT 0	
L456	1-414-235-22	INDUCTOR CHIP 0uH	
L457	1-414-235-22	INDUCTOR CHIP 0uH	
L458	1-216-295-91	SHORT 0	
L459	1-216-295-91	SHORT 0	
L460	1-216-295-91	SHORT 0	
L461	1-216-295-91	SHORT 0	
L462	1-216-295-91	SHORT 0	

Ref. No.	Part No.	Description	Remarks
L463	1-414-235-22	INDUCTOR CHIP 0uH	
L601	1-414-235-22	INDUCTOR CHIP 0uH	
L603	1-412-056-11	INDUCTOR CHIP 4.7uH	
L604	1-414-235-22	INDUCTOR CHIP 0uH	
L684	1-412-056-11	INDUCTOR CHIP 4.7uH	
		< TRANSISTOR >	
Q1	8-729-421-22	TRANSISTOR UN2211-TX	
Q2	8-729-602-21	TRANSISTOR 2SC4154TP-1EF	
Q3	8-729-421-22	TRANSISTOR UN2211-TX	
Q4	8-729-602-21	TRANSISTOR 2SC4154TP-1EF	
Q5	8-729-421-22	TRANSISTOR UN2211-TX	
Q200	8-729-231-55	TRANSISTOR 2SC2878AB-TPE2	
Q201	8-729-231-55	TRANSISTOR 2SC2878AB-TPE2	
Q202	8-729-231-55	TRANSISTOR 2SC2878AB-TPE2	
Q203	8-729-231-55	TRANSISTOR 2SC2878AB-TPE2	
Q321	8-729-620-05	TRANSISTOR 2SC2603TP-EF	
Q401	8-729-900-51	TRANSISTOR UN2115-QRS(TX)	
Q405	8-729-281-53	TRANSISTOR 2SC945TP-K	
Q451	8-729-421-22	TRANSISTOR UN2211-TX	
Q452	8-729-119-76	TRANSISTOR 2SA1115TP-EF	
		< RESISTOR >	
R3	1-216-025-91	RES-CHIP 100 5% 1/10W	
R4	1-216-295-91	SHORT 0	
R5	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R10	1-216-295-91	SHORT 0	
R24	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R26	1-216-295-91	SHORT 0	
R28	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R30	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R36	1-216-295-91	SHORT 0	
R37	1-216-295-91	SHORT 0	
R38	1-216-295-91	SHORT 0	
R42	1-216-295-91	SHORT 0	
R43	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R44	1-216-295-91	SHORT 0	
R45	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R49	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R50	1-216-295-91	SHORT 0	
R51	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R52	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R54	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R65	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R67	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R68	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R86	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R88	1-216-073-00	METAL CHIP 10K 5% 1/10W	(US,CND)
R89	1-216-073-00	METAL CHIP 10K 5% 1/10W	(AEP,UK)
R115	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R116	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R117	1-216-295-91	SHORT 0	
R118	1-216-295-91	SHORT 0	
R119	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R120	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R121	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R122	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R123	1-216-073-00	METAL CHIP 10K 5% 1/10W	

AU

Ref. No.	Part No.	Description			Remarks
R124	1-216-073-00	METAL CHIP	10K	5%	1/10W
R134	1-216-073-00	METAL CHIP	10K	5%	1/10W
R135	1-216-073-00	METAL CHIP	10K	5%	1/10W
R136	1-216-073-00	METAL CHIP	10K	5%	1/10W
R137	1-216-073-00	METAL CHIP	10K	5%	1/10W
R138	1-216-073-00	METAL CHIP	10K	5%	1/10W
R139	1-216-073-00	METAL CHIP	10K	5%	1/10W
R141	1-216-073-00	METAL CHIP	10K	5%	1/10W
R144	1-216-073-00	METAL CHIP	10K	5%	1/10W
R151	1-216-073-00	METAL CHIP	10K	5%	1/10W
R152	1-216-073-00	METAL CHIP	10K	5%	1/10W
R153	1-216-073-00	METAL CHIP	10K	5%	1/10W
R154	1-216-073-00	METAL CHIP	10K	5%	1/10W
R155	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R156	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R157	1-216-073-00	METAL CHIP	10K	5%	1/10W
R158	1-216-073-00	METAL CHIP	10K	5%	1/10W
R159	1-216-025-91	RES-CHIP	100	5%	1/10W
R201	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R202	1-216-001-00	METAL CHIP	10	5%	1/10W
R203	1-216-033-00	METAL CHIP	220	5%	1/10W
R204	1-216-001-00	METAL CHIP	10	5%	1/10W
R205	1-216-001-00	METAL CHIP	10	5%	1/10W
R206	1-216-627-11	METAL CHIP	100	0.5%	1/10W
R207	1-216-021-00	METAL CHIP	68	5%	1/10W
R208	1-216-627-11	METAL CHIP	100	0.5%	1/10W
R209	1-216-627-11	METAL CHIP	100	0.5%	1/10W
R210	1-216-627-11	METAL CHIP	100	0.5%	1/10W
R221	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R222	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R223	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R224	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R225	1-216-295-91	SHORT	0		
R226	1-216-295-91	SHORT	0		
R227	1-216-663-11	METAL CHIP	3.3K	0.5%	1/10W
R228	1-216-295-91	SHORT	0		
R229	1-216-663-11	METAL CHIP	3.3K	0.5%	1/10W
R230	1-216-295-91	SHORT	0		
R231	1-216-663-11	METAL CHIP	3.3K	0.5%	1/10W
R232	1-216-663-11	METAL CHIP	3.3K	0.5%	1/10W
R233	1-216-669-11	METAL CHIP	5.6K	0.5%	1/10W
R234	1-216-669-11	METAL CHIP	5.6K	0.5%	1/10W
R235	1-216-651-11	METAL CHIP	1K	0.5%	1/10W
R236	1-216-651-11	METAL CHIP	1K	0.5%	1/10W
R237	1-216-033-00	METAL CHIP	220	5%	1/10W
R238	1-216-033-00	METAL CHIP	220	5%	1/10W
R239	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R240	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R241	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R242	1-216-033-00	METAL CHIP	220	5%	1/10W
R254	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R271	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R272	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R273	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R274	1-216-071-00	METAL CHIP	8.2K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R275	1-216-295-91	SHORT	0		
R276	1-216-295-91	SHORT	0		
R277	1-216-663-11	METAL CHIP	3.3K	0.5%	1/10W
R278	1-216-295-91	SHORT	0		
R279	1-216-663-11	METAL CHIP	3.3K	0.5%	1/10W
R280	1-216-295-91	SHORT	0		
R281	1-216-663-11	METAL CHIP	3.3K	0.5%	1/10W
R282	1-216-663-11	METAL CHIP	3.3K	0.5%	1/10W
R283	1-216-669-11	METAL CHIP	5.6K	0.5%	1/10W
R284	1-216-669-11	METAL CHIP	5.6K	0.5%	1/10W
R285	1-216-651-11	METAL CHIP	1K	0.5%	1/10W
R286	1-216-651-11	METAL CHIP	1K	0.5%	1/10W
R287	1-216-033-00	METAL CHIP	220	5%	1/10W
R288	1-216-033-00	METAL CHIP	220	5%	1/10W
R289	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R290	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R291	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R292	1-216-033-00	METAL CHIP	220	5%	1/10W
R300	1-216-025-91	RES-CHIP	100	5%	1/10W
R301	1-216-025-91	RES-CHIP	100	5%	1/10W
R302	1-216-025-91	RES-CHIP	100	5%	1/10W
R303	1-216-025-91	RES-CHIP	100	5%	1/10W
R304	1-216-025-91	RES-CHIP	100	5%	1/10W
R305	1-216-073-00	METAL CHIP	10K	5%	1/10W
R306	1-216-097-91	RES-CHIP	100K	5%	1/10W
R307	1-216-025-91	RES-CHIP	100	5%	1/10W
R308	1-216-073-00	METAL CHIP	10K	5%	1/10W
R309	1-216-121-91	RES-CHIP	1M	5%	1/10W
R310	1-216-025-91	RES-CHIP	100	5%	1/10W
R311	1-216-025-91	RES-CHIP	100	5%	1/10W
R312	1-216-025-91	RES-CHIP	100	5%	1/10W
R313	1-216-022-00	METAL CHIP	75	5%	1/10W
R314	1-216-033-00	METAL CHIP	220	5%	1/10W
R315	1-216-022-00	METAL CHIP	75	5%	1/10W
R316	1-216-025-91	RES-CHIP	100	5%	1/10W
R322	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R323	1-216-073-00	METAL CHIP	10K	5%	1/10W
R324	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R325	1-216-001-00	METAL CHIP	10	5%	1/10W
R326	1-216-295-91	SHORT	0		
R327	1-216-295-91	SHORT	0		
R401	1-216-045-00	METAL CHIP	680	5%	1/10W
R402	1-216-041-00	METAL CHIP	470	5%	1/10W
R404	1-216-295-91	SHORT	0		
R405	1-216-039-00	METAL CHIP	390	5%	1/10W
R406	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R408	1-216-033-00	METAL CHIP	220	5%	1/10W
R409	1-220-264-11	RES-CHIP	1K	5%	1/4W
R411	1-216-097-91	RES-CHIP	100K	5%	1/10W
R413	1-216-073-00	METAL CHIP	10K	5%	1/10W
R451	1-216-097-91	RES-CHIP	100K	5%	1/10W
R452	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R453	1-216-099-00	METAL CHIP	120K	5%	1/10W
R601	1-216-627-11	METAL CHIP	100	0.5%	1/10W
R602	1-218-776-11	RES-CHIP	1M	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R603	1-216-687-11	METAL CHIP	33K	0.5%	1/10W
R605	1-216-679-11	METAL CHIP	15K	0.5%	1/10W
R607	1-216-627-11	METAL CHIP	100	0.5%	1/10W
R608	1-216-627-11	METAL CHIP	100	0.5%	1/10W
R631	1-216-627-11	METAL CHIP	100	0.5%	1/10W
R632	1-216-627-11	METAL CHIP	100	0.5%	1/10W
R633	1-216-627-11	METAL CHIP	100	0.5%	1/10W
R634	1-216-619-11	METAL CHIP	47	0.5%	1/10W
R635	1-216-619-11	METAL CHIP	47	0.5%	1/10W
R636	1-216-619-11	METAL CHIP	47	0.5%	1/10W
R637	1-216-651-11	METAL CHIP	1K	0.5%	1/10W
R651	1-216-627-11	METAL CHIP	100	0.5%	1/10W
R652	1-218-776-11	RES-CHIP	1M	5%	1/10W
R653	1-216-687-11	METAL CHIP	33K	0.5%	1/10W
R655	1-216-679-11	METAL CHIP	15K	0.5%	1/10W
R657	1-216-627-11	METAL CHIP	100	0.5%	1/10W
R658	1-216-627-11	METAL CHIP	100	0.5%	1/10W
R987	1-216-073-00	METAL CHIP	10K	5%	1/10W
R988	1-216-073-00	METAL CHIP	10K	5%	1/10W (AEP,UK)
R989	1-216-073-00	METAL CHIP	10K	5%	1/10W (US,CND)
R1014	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1026	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1117	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1118	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1123	1-216-295-91	SHORT	0		
R1124	1-216-295-91	SHORT	0		
R1129	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1136	1-216-295-91	SHORT	0		
R1137	1-216-295-91	SHORT	0		
R1138	1-216-295-91	SHORT	0		
R1139	1-216-295-91	SHORT	0		
		< COMPOSITION CIRCUIT BLOCK >			
RB101	1-236-908-11	NETWORK RESISTOR (CHIP) 10K			
RB102	1-236-908-11	NETWORK RESISTOR (CHIP) 10K			
RB103	1-236-908-11	NETWORK RESISTOR (CHIP) 10K			
		< TRANSFORMER >			
T301	1-416-701-11	COIL (WITH CORE)			
		< VIBRATOR >			
X1	1-781-174-21	VIBRATOR, CERAMIC (10MHz)			
X2	1-567-098-41	VIBRATOR, CRYSTAL (32.768MHz)			
X200	1-760-955-11	VIBRATOR, CRYSTAL (45.1584MHz)			
**********					
	A-4725-054-A	BD BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C101	1-135-259-11	TANTAL. CHIP	10uF	20.00%	6.3V
C102	1-135-259-11	TANTAL. CHIP	10uF	20.00%	6.3V
C103	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C104	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C105	1-115-416-11	CERAMIC CHIP	1000PF	5.00%	25V

Ref. No.	Part No.	Description			Remarks
C106	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C107	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C108	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C109	1-164-677-11	CERAMIC CHIP	0.033uF	10.00%	16V
C110	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C111	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C112	1-110-563-11	CERAMIC CHIP	0.068uF	10.00%	16V
C113	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C114	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C115	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C116	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C117	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C118	1-165-176-11	CERAMIC CHIP	0.047uF	10.00%	16V
C119	1-165-176-11	CERAMIC CHIP	0.047uF	10.00%	16V
C120	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C121	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C125	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C128	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C131	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C132	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C133	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C141	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C142	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C143	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C144	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C145	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C146	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C147	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C151	1-117-370-11	CERAMIC CHIP	10uF		10V
C152	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C153	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C154	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C155	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C156	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C157	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C158	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C159	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C160	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C161	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C162	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C163	1-125-891-11	CERAMIC CHIP	0.47uF	10.00%	10V
C164	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C165	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C166	1-125-891-11	CERAMIC CHIP	0.47uF	10.00%	10V
C167	1-164-245-11	CERAMIC CHIP	0.015uF	10.00%	25V
C169	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C171	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C172	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C180	1-117-370-11	CERAMIC CHIP	10uF		10V
C181	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C182	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C183	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C184	1-117-970-11	ELECT CHIP	22uF	20.00%	10V
C185	1-131-872-91	CERAMIC CHIP	1000PF	10%	630V
C191	1-126-206-11	ELECT CHIP	100uF	20%	6.3V

BD

Ref. No.	Part No.	Description			Remarks
C192	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C193	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C194	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C195	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C196	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C1401	1-117-720-11	CERAMIC CHIP	4.7uF		10V
		< CONNECTOR >			
CN101	1-766-833-21	CONNECTOR, FFC/FPC (ZIF) 21P			
CN102	1-784-835-21	CONNECTOR,FFC(LIF(NON-ZIF))27P			
CN103	1-784-834-21	CONNECTOR,FFC(LIF(NON-ZIF))23P			
* CN104	1-580-055-21	PIN, CONNECTOR (SMD) 2P			
CN105	1-784-859-21	CONNECTOR, FFC(LIF(NON-ZIF))7P			
		< DIODE >			
D101	8-719-988-61	DIODE 1SS355TE-17			
D181	8-719-080-81	DIODE FS1J6			
D183	8-719-080-81	DIODE FS1J6			
		< IC >			
IC101	8-752-080-95	IC CXA2523AR			
IC102	8-759-473-51	IC TLV2361CDBV			
IC141	8-759-430-25	IC BH6511FS-E2			
IC151	8-752-404-64	IC CXD2662R			
IC153	8-759-671-27	IC MSM51V4400D-10TSK-FS			
IC171	8-759-096-87	IC TC7WU04FU(TE12R)			
IC181	8-759-481-17	IC MC74ACT08DTR2			
IC190	8-759-460-72	IC BA033FP-E2			
IC195	8-759-640-41	IC BR24C08F-E2			
		< JUMPER RESISTOR >			
JW201	1-216-295-91	SHORT	0		
JW202	1-216-295-91	SHORT	0		
JW203	1-216-295-91	SHORT	0		
JW903	1-216-295-91	SHORT	0		
JW904	1-216-295-91	SHORT	0		
		< COIL >			
L101	1-500-245-11	INDUCTOR CHIP	0uH		
L102	1-500-245-11	INDUCTOR CHIP	0uH		
L103	1-500-245-11	INDUCTOR CHIP	0uH		
L105	1-414-235-22	INDUCTOR CHIP	0uH		
L106	1-500-245-11	INDUCTOR CHIP	0uH		
L121	1-500-245-11	INDUCTOR CHIP	0uH		
L122	1-500-245-11	INDUCTOR CHIP	0uH		
L131	1-500-245-11	INDUCTOR CHIP	0uH		
L141	1-412-029-11	INDUCTOR CHIP	10uH		
L142	1-412-032-11	INDUCTOR CHIP	100uH		
L143	1-412-029-11	INDUCTOR CHIP	10uH		
L144	1-412-032-11	INDUCTOR CHIP	100uH		
L145	1-412-032-11	INDUCTOR CHIP	100uH		
L146	1-469-855-21	INDUCTOR	0uH		
L147	1-469-855-21	INDUCTOR	0uH		
L161	1-500-245-11	INDUCTOR CHIP	0uH		
L171	1-500-245-11	INDUCTOR CHIP	0uH		
L180	1-469-855-21	INDUCTOR	0uH		
L181	1-469-855-21	INDUCTOR	0uH		
L182	1-500-245-11	INDUCTOR CHIP	0uH		

Ref. No.	Part No.	Description			Remarks
L183	1-216-296-91	SHORT	0		
L184	1-216-296-91	SHORT	0		
		< TRANSISTOR >			
Q101	8-729-403-35	TRANSISTOR	UN5113-TX		
Q121	8-729-403-35	TRANSISTOR	UN5113-TX		
Q122	8-729-101-07	TRANSISTOR	2SB798-T1DK		
Q131	8-729-026-53	TRANSISTOR	2SA1576A-T106-QR		
Q132	8-729-903-10	TRANSISTOR	FMW1-T-148		
Q133	8-729-402-93	TRANSISTOR	UN5214-TX		
Q134	8-729-402-93	TRANSISTOR	UN5214-TX		
Q181	8-729-018-75	TRANSISTOR	2SJ278MYTR		
Q182	8-729-017-65	TRANSISTOR	2SK1764KYTR		
		< RESISTOR >			
R101	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R102	1-216-853-11	METAL CHIP	470K	5%	1/16W
R103	1-216-863-11	RES-CHIP	3.3M	5%	1/16W
R104	1-216-853-11	METAL CHIP	470K	5%	1/16W
R105	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R106	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R107	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R108	1-216-833-91	RES-CHIP	10K	5%	1/16W
R109	1-216-845-11	METAL CHIP	100K	5%	1/16W
R110	1-216-845-11	METAL CHIP	100K	5%	1/16W
R111	1-216-833-91	RES-CHIP	10K	5%	1/16W
R112	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R113	1-216-833-91	RES-CHIP	10K	5%	1/16W
R114	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R115	1-216-833-91	RES-CHIP	10K	5%	1/16W
R116	1-216-839-11	METAL CHIP	33K	5%	1/16W
R117	1-216-837-11	METAL CHIP	22K	5%	1/16W
R118	1-218-855-11	METAL CHIP	2.2K	0.5%	1/16W
R119	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R120	1-218-889-11	METAL CHIP	56K	0.5%	1/16W
R121	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R122	1-218-855-11	METAL CHIP	2.2K	0.5%	1/16W
R123	1-216-819-11	METAL CHIP	680	5%	1/16W
R124	1-216-809-11	METAL CHIP	100	5%	1/16W
R125	1-216-815-11	METAL CHIP	330	5%	1/16W
R126	1-216-819-11	METAL CHIP	680	5%	1/16W
R127	1-216-845-11	METAL CHIP	100K	5%	1/16W
R128	1-219-724-11	METAL CHIP	1	1%	1/4W
R129	1-216-298-00	METAL CHIP	2.2	5%	1/10W
R130	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R131	1-216-833-91	RES-CHIP	10K	5%	1/16W
R132	1-216-841-11	METAL CHIP	47K	5%	1/16W
R133	1-216-821-11	METAL CHIP	1K	5%	1/16W
R134	1-216-821-11	METAL CHIP	1K	5%	1/16W
R135	1-216-821-11	METAL CHIP	1K	5%	1/16W
R136	1-216-295-91	SHORT	0		
R138	1-216-833-91	RES-CHIP	10K	5%	1/16W
R150	1-216-833-91	RES-CHIP	10K	5%	1/16W
R151	1-216-833-91	RES-CHIP	10K	5%	1/16W
R154	1-216-833-91	RES-CHIP	10K	5%	1/16W

Ref. No.	Part No.	Description			Remarks
R155	1-216-864-11	METAL CHIP	0	5%	1/16W
R156	1-216-864-11	METAL CHIP	0	5%	1/16W
R157	1-216-809-11	METAL CHIP	100	5%	1/16W
R158	1-216-809-11	METAL CHIP	100	5%	1/16W
R159	1-216-833-91	RES-CHIP	10K	5%	1/16W
R160	1-216-833-91	RES-CHIP	10K	5%	1/16W
R161	1-216-833-91	RES-CHIP	10K	5%	1/16W
R163	1-216-809-11	METAL CHIP	100	5%	1/16W
R164	1-216-809-11	METAL CHIP	100	5%	1/16W
R165	1-216-809-11	METAL CHIP	100	5%	1/16W
R167	1-216-833-91	RES-CHIP	10K	5%	1/16W
R168	1-216-845-11	METAL CHIP	100K	5%	1/16W
R169	1-216-855-11	METAL CHIP	680K	5%	1/16W
R170	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R171	1-216-821-11	METAL CHIP	1K	5%	1/16W
R173	1-216-821-11	METAL CHIP	1K	5%	1/16W
R174	1-216-811-11	METAL CHIP	150	5%	1/16W
R175	1-216-857-11	METAL CHIP	1M	5%	1/16W
R176	1-216-809-11	METAL CHIP	100	5%	1/16W
R179	1-216-295-91	SHORT	0		
R181	1-216-841-11	METAL CHIP	47K	5%	1/16W
R182	1-216-841-11	METAL CHIP	47K	5%	1/16W
R183	1-216-841-11	METAL CHIP	47K	5%	1/16W
R184	1-220-942-11	METAL CHIP	3.3	1%	1/4W
R185	1-220-942-11	METAL CHIP	3.3	1%	1/4W
R195	1-216-833-91	RES-CHIP	10K	5%	1/16W
R196	1-216-833-91	RES-CHIP	10K	5%	1/16W
R197	1-216-833-91	RES-CHIP	10K	5%	1/16W
R218	1-216-864-11	METAL CHIP	0	5%	1/16W
		< SWITCH >			
S101	1-762-596-21	SWITCH, PUSH (1 KEY)(LIMIT IN)			
S103	1-771-956-21	SWITCH, PUSH (1 KEY)(OUT)			
S104	1-771-955-21	SWITCH, PUSH (1 KEY)(PLAY)			
S105	1-771-955-21	SWITCH, PUSH (1 KEY)(REC)			

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	A-4725-110-A	DISP BOARD, COMPLETE			
		**********			
*	4-955-901-01	CUSHION (FL)			
*	4-996-686-11	HOLDER (FL)			
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S			
		< CAPACITOR >			
C708	1-162-294-31	CERAMIC	0.001uF	10%	50V
C709	1-162-294-31	CERAMIC	0.001uF	10%	50V
C710	1-164-159-11	CERAMIC	0.1uF		50V
C770	1-164-159-11	CERAMIC	0.1uF		50V
C771	1-164-159-11	CERAMIC	0.1uF		50V
C772	1-162-213-31	CERAMIC	39PF	5.00%	50V
C773	1-162-294-31	CERAMIC	0.001uF	10%	50V
C774	1-162-282-31	CERAMIC	100PF	10%	50V
C775	1-162-282-31	CERAMIC	100PF	10%	50V
C776	1-162-282-31	CERAMIC	100PF	10%	50V
C777	1-164-159-11	CERAMIC	0.1uF		50V
C778	1-164-159-11	CERAMIC	0.1uF		50V
C779	1-124-589-11	ELECT	47uF	20%	16V
C781	1-164-159-11	CERAMIC	0.1uF		50V
C782	1-164-159-11	CERAMIC	0.1uF		50V

Ref. No.	Part No.	Description			Remarks
C783	1-124-261-00	ELECT	10uF	20%	50V
C784	1-124-261-00	ELECT	10uF	20%	50V
		< LEAD >			
* CLP700	1-690-880-31	LEAD (WITH CONNECTOR)			
		< CONNECTOR >			
* CN751	1-691-407-11	CONNECTOR, BOARD TO BOARD 10P			
CN753	1-778-318-11	CONNECTOR, BOARD TO BOARD 13P			
		< DIODE >			
D759	8-719-313-45	DIODE SEL6810A-TH10			
		< FILTER >			
FL781	1-517-987-11	INDICATOR TUBE, FLUORESCENT			
		< IC >			
IC771	8-759-680-17	IC MSM9201-04GS-K			
		< TRANSISTOR >			
Q759	8-729-900-80	TRANSISTOR UN4211-TA			
Q781	8-729-620-05	TRANSISTOR 2SC2603TP-EF			
Q782	8-729-620-05	TRANSISTOR 2SC2603TP-EF			
		< RESISTOR >			
R759	1-247-800-11	CARBON	51	5%	1/4W
R770	1-249-417-11	CARBON	1K	5%	1/4W F
R771	1-249-417-11	CARBON	1K	5%	1/4W F
R772	1-247-843-11	CARBON	3.3K	5%	1/4W
R773	1-247-807-31	CARBON	100	5%	1/4W
R774	1-247-807-31	CARBON	100	5%	1/4W
R775	1-247-807-31	CARBON	100	5%	1/4W
R776	1-247-807-31	CARBON	100	5%	1/4W
R777	1-249-417-11	CARBON	1K	5%	1/4W F
R778	1-249-417-11	CARBON	1K	5%	1/4W F
R781	1-247-807-31	CARBON	100	5%	1/4W
R782	1-249-441-11	CARBON	100K	5%	1/4W
R783	1-247-807-31	CARBON	100	5%	1/4W
R784	1-249-441-11	CARBON	100K	5%	1/4W

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	1-677-836-11	HP BOARD			
		*********			
		< CAPACITOR >			
C809	1-126-933-11	ELECT	100uF	20.00%	16V
C810	1-126-933-11	ELECT	100uF	20.00%	16V
C811	1-162-294-31	CERAMIC	0.001uF	10%	50V
C812	1-162-294-31	CERAMIC	0.001uF	10%	50V
C813	1-164-159-11	CERAMIC	0.1uF		50V
C814	1-164-159-11	CERAMIC	0.1uF		50V
		< CONNECTOR >			
CN801	1-691-769-31	PLUG (MICRO CONNECTOR) 7P			

HP **KEY** **PSW**

Ref. No.	Part No.	Description			Remarks
		< IC >			
IC802	8-759-634-50	IC M5218AL			
		< JACK >			
J802	1-770-307-11	JACK (LARGE TYPE)(PHONES)			
		< TRANSISTOR >			
Q801	8-729-231-55	TRANSISTOR 2SC2878AB-TPE2			
Q802	8-729-231-55	TRANSISTOR 2SC2878AB-TPE2			
		< RESISTOR >			
R808	1-247-807-31	CARBON	100	5%	1/4W
R809	1-247-807-31	CARBON	100	5%	1/4W
R810	1-249-433-11	CARBON	22K	5%	1/4W
R811	1-249-429-11	CARBON	10K	5%	1/4W
R812	1-249-441-11	CARBON	100K	5%	1/4W
R813	1-249-441-11	CARBON	100K	5%	1/4W
R814	1-249-433-11	CARBON	22K	5%	1/4W
R815	1-249-429-11	CARBON	10K	5%	1/4W
R816	1-249-433-11	CARBON	22K	5%	1/4W
R817	1-249-433-11	CARBON	22K	5%	1/4W
R819	1-249-429-11	CARBON	10K	5%	1/4W
R820	1-249-429-11	CARBON	10K	5%	1/4W
		< VARIABLE RESISTOR >			
RV801	1-227-208-11	RES, VAR 20K/20K (PHONE LEVEL)			
**********					
	1-678-501-11	KEY BOARD			
		**********			
		< CAPACITOR >			
C801	1-164-159-11	CERAMIC	0.1uF		50V
C802	1-164-159-11	CERAMIC	0.1uF		50V
C803	1-164-159-11	CERAMIC	0.1uF		50V
C804	1-164-159-11	CERAMIC	0.1uF		50V
C806	1-164-159-11	CERAMIC	0.1uF		50V
C807	1-104-396-11	ELECT	10uF	20.00%	16V
C808	1-164-159-11	CERAMIC	0.1uF		50V
		< CONNECTOR >			
* CN800	1-564-708-11	PIN, CONNECTOR (SMALL TYPE) 6P			
		< FERRITE BEAD >			
FB801	1-424-122-11	FILTER, NOISE			
FB802	1-424-122-11	FILTER, NOISE			
FB803	1-424-122-11	FILTER, NOISE			
FB804	1-424-122-11	FILTER, NOISE			
FB805	1-414-747-11	INDUCTOR	0UH		
		< JACK >			
J801	1-785-945-21	CONNECTOR, DIN (KEYBOARD)			
		< COIL >			
L801	1-410-324-11	INDUCTOR	4.7uH		
**********					

Ref. No.	Part No.	Description			Remarks
	A-4725-111-A	PSW BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C731	1-162-294-31	CERAMIC	0.001uF	10%	50V
C751	1-164-159-11	CERAMIC	0.1uF		50V
C752	1-164-159-11	CERAMIC	0.1uF		50V
C761	1-124-589-11	ELECT	47uF	20%	16V
C762	1-164-159-11	CERAMIC	0.1uF		50V
		< CONNECTOR >			
* CN750	1-691-409-11	CONNECTOR, BOARD TO BOARD 10P			
		< DIODE >			
D756	8-719-313-43	DIODE SEL6210S-TH10 (STANDBY)			
D757	8-719-038-54	DIODE SEL5520C-TP15 (FILTER)			
D758	8-719-812-44	DIODE SEL5220S-TP15 (SF EDIT)			
		< IC >			
IC761	8-749-013-91	IC GP1UC8X			
		< TRANSISTOR >			
Q755	8-729-900-80	TRANSISTOR UN4211-TA			
Q757	8-729-900-80	TRANSISTOR UN4211-TA			
Q758	8-729-900-80	TRANSISTOR UN4211-TA			
		< RESISTOR >			
R722	1-249-421-11	CARBON	2.2K	5%	1/4W F
R723	1-247-843-11	CARBON	3.3K	5%	1/4W
R724	1-249-425-11	CARBON	4.7K	5%	1/4W F
R726	1-247-870-11	CARBON	43K	5%	1/4W
R732	1-249-421-11	CARBON	2.2K	5%	1/4W F
R734	1-249-428-11	CARBON	8.2K	5%	1/4W F
R752	1-249-429-11	CARBON	10K	5%	1/4W
R756	1-249-409-11	CARBON	220	5%	1/4W F
R757	1-247-800-11	CARBON	51	5%	1/4W
R758	1-247-800-11	CARBON	51	5%	1/4W
R760	1-249-401-11	CARBON	47	5%	1/4W F
R762	1-247-807-31	CARBON	100	5%	1/4W
		< SWITCH >			
S722	1-762-875-21	SWITCH, KEYBOARD (PLAY MODE)			
S723	1-762-875-21	SWITCH, KEYBOARD (REPEAT)			
S724	1-762-875-21	SWITCH, KEYBOARD (DISPLAY/CHAR)			
S725	1-762-875-21	SWITCH, KEYBOARD (STANDBY)			
S731	1-762-875-21	SWITCH, KEYBOARD (TIME)			
S732	1-762-875-21	SWITCH, KEYBOARD (SF-EDIT)			
S733	1-762-875-21	SWITCH, KEYBOARD (FILTER)			
S751	1-572-625-11	SWITCH, SLIDE (TIME)			
**********					

Ref. No.	Part No.	Description				Remarks
	A-4725-114-A	SW BOARD, COMPLETE				
		**********				
		< CAPACITOR >				
C700	1-124-589-11	ELECT	47uF	20%	16V	
C701	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C711	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C721	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C765	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C766	1-162-294-31	CERAMIC	0.001uF	10%	50V	
		< CONNECTOR >				
CN701	1-779-556-21	CONNECTOR,FFC(LIF(NON-ZIF))19P				
CN752	1-778-317-11	CONNECTOR, BOARD TO BOARD 13P				
		< RESISTOR >				
R702	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R703	1-247-843-11	CARBON	3.3K	5%	1/4W	
R704	1-249-425-11	CARBON	4.7K	5%	1/4W	F
R705	1-249-429-11	CARBON	10K	5%	1/4W	
R706	1-249-435-11	CARBON	33K	5%	1/4W	
R712	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R713	1-247-843-11	CARBON	3.3K	5%	1/4W	
R714	1-249-425-11	CARBON	4.7K	5%	1/4W	F
R717	1-249-429-11	CARBON	10K	5%	1/4W	
R718	1-249-435-11	CARBON	33K	5%	1/4W	
		< VARIABLE RESISTOR >				
RV760	1-418-363-11	ENCODER, ROTARY (REC LEVEL)				
		< SWITCH >				
S701	1-762-875-21	SWITCH, KEYBOARD (REC)				
S702	1-762-875-21	SWITCH, KEYBOARD (■)				
S703	1-762-875-21	SWITCH, KEYBOARD (▶▶)				
S704	1-762-875-21	SWITCH, KEYBOARD (◀◀)				
S705	1-762-875-21	SWITCH, KEYBOARD (▮▮)				
S706	1-762-875-21	SWITCH, KEYBOARD (▷)				
S711	1-762-875-21	SWITCH, KEYBOARD (MENU/NO)				
S712	1-762-875-21	SWITCH, KEYBOARD (YES)				
S713	1-475-543-11	ENCODER, ROTARY (AMS)				
S714	1-762-875-21	SWITCH, KEYBOARD (CLEAR)				
S716	1-762-875-21	SWITCH, KEYBOARD (INPUT)				
S717	1-762-875-21	SWITCH, KEYBOARD (REC MODE)				
S721	1-762-875-21	SWITCH, KEYBOARD (EJECT)				

Ref. No.	Part No.	Description	Remarks
		MISCELLANEOUS	
		**********	
1	1-792-926-11	WIRE(FLAT TYPE) (19 CORE)	
9	1-792-925-11	WIRE(FLAT TYPE) (23 CORE)	
10	1-792-810-11	WIRE(FLAT TYPE) (27 CORE)	
13	1-500-051-11	BEAD, FERRITE (WITH CASE)	
⚠18	1-558-568-21	CORD, POWER (AEP)	
⚠18	1-696-586-11	CORD, POWER (UK)	
⚠18	1-790-154-31	CORD, POWER (US,CND)	
257	1-678-514-11	PWB, FLEXIBLE	
⚠258	A-4672-541-A	OPTICAL PICK-UP KMS-260A	
S102	1-771-957-11	SWITCH, PUSH (2 KEY)	
⚠T701	1-435-581-11	TRANSFORMER, POWER (AEP,UK)	
⚠T701	1-435-582-11	TRANSFORMER, POWER (US,CND)	
HR901	1-500-670-22	HEAD, OVER LIGHT	
M101	A-4735-757-A	MOTOR ASSY, SPINDLE	
M102	A-4672-900-A	MOTOR ASSY, SLED	
M103	A-4672-975-A	MOTOR ASSY, LOADING	
		ACCESSORIES & PACKING MATERIALS	
		**********	
	1-476-081-11	REMOTE COMMANDER (RM-D49M)	
	1-574-264-11	CORD,LIGHT PLUG	
	1-574-264-11	CORD,OPTICAL PLUG	
	1-791-732-11	CORD,CONNECTION	
	4-229-607-11	MANUAL, INSTRUCTION(ENGLISH)	
	4-229-607-21	MANUAL, INSTRUCTION (SPANISH,PORTUGUESE)(AEP)	
	4-229-607-31	MANUAL, INSTRUCTION (GERMAN,DUTCH,SWEDISH,ITALIAN)(AEP)	
	4-229-724-01	CARD(KEYBOARD CHART LIST)	
	4-983-537-01	COVER,BATTERY (for RM-D49M)	
		**********	
		HARDWARE LIST	
		**********	
#1	7-685-646-79	SCREW +BVTP3X8 TYPE2 N-S	
#2	7-685-885-09	SCREW +BVTT4X16 (S)	
#3	7-685-204-19	SCREW +KTP2X6 TYPE2 NON-SLIT	
#4	7-685-850-04	SCREW +BVTT 2X3 (S)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

REVISION HISTORY

Clicking the version allows you to jump to the revised page.
Also, clicking the version at the upper right on the revised page allows you to jump to the next revised page.

Ver.	Date	Description of Revision
1.0	2000.09	New
1.1	2005.03	Exchange of Parts No. and Description of Ref.No. 214 and 215 (SPM-05011)
1.2	2005.12	Correction of Parts No. of Ref. No. 51 (SPM-05089)